UNITED STATES DISTRICT COURT

WESTERN DISTRICT OF WASHINGTON

AT SEATTLE

SHOALWATER BAY INDIAN TRIBE,

Plaintiff,

v.

EXXON MOBIL CORPORATION, EXXONMOBIL OIL CORPORATION, BP P.L.C., BP AMERICA INC., CHEVRON CORPORATION, CHEVRON U.S.A. INC., SHELL PLC, SHELL OIL COMPANY, CONOCOPHILLIPS, CONOCOPHILLIPS COMPANY, PHILLIPS 66, and PHILLIPS 66 COMPANY,

Defendants.

Case No.

DECLARATION OF JOSHUA D. DICK IN SUPPORT OF NOTICE OF REMOVAL BY DEFENDANTS CHEVRON CORPORATION AND CHEVRON U.S.A. INC.

[Removal from the Superior Court of the State of Washington, King County, Cause No. 23-2-25215-2 SEA]

Action Filed: February 6, 2024

GIBSON, DUNN & CRUTCHER LLP
333 SOUTH GRAND AVENUE,
LOS ANGELES, CA 90071-3197
213.229.7000

I, Joshua D. Dick, declare as follows:

1. I am an attorney admitted to practice in the State of California, and my application for admission *pro hac vice* before this Court is forthcoming. I am a partner in the law firm of Gibson, Dunn & Crutcher, LLP, and I am one of the attorneys responsible for the representation of Defendants Chevron Corporation and Chevron U.S.A. Inc. (together "the Chevron Parties") in this matter. I make this declaration in support of the Chevron Parties' Notice of Removal, filed concurrently herewith.

2. Unless otherwise stated, the following facts are within my personal knowledge through personal review of the documents and information described herein or through information gathered and provided to me by individuals at my firm, at my direction. If called and sworn as a witness, I could and would testify competently thereto.

3. I have consulted with my clients, and I have been informed that Chevron U.S.A. Inc. was served on January 17, 2024 by Plaintiff Makah Indian Tribe with a copy of the Complaint filed in the Superior Court of the State of Washington in and for King County on December 20, 2023. The Notice of Removal is being filed not more than thirty (30) days after Chevron U.S.A. Inc. was served with a copy of the initial pleading setting forth the claims for relief upon which this action is based. 28 U.S.C § 1446(b).

4. "[A] defendants who have been properly joined and served" consent to the removal of this action. 28 U.S.C. § 1446(b)(2)(A). Such consents were provided to counsel for the Chevron Parties in correspondence with the other served Defendants and/or their counsel.

5. Pursuant to 28 U.S.C § 1446(a), attached hereto as **Exhibit 1** are copies of all process, pleadings, and orders from the state-court action being removed to this Court that the Chevron Parties have been able to obtain from the Superior Court which are in the possession of the Chevron Parties. Pursuant to 28 U.S.C § 1446(a), this constitutes "a copy of all process, pleadings, and orders" received by the Chevron Parties in the action.

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6. Attached hereto as **Exhibit 2** is a true and correct copy of a news article published on the website of the *Seattle Times* on December 21, 2023, titled "Two PNW tribal nations sue oil companies over costs of climate change."

7. Attached hereto as **Exhibit 3** is a true and correct copy of the Treaty of Neah Bay between the United States and the Makah, 12 Stat. 939 (1855).

I declare under penalty of perjury under the laws of the State of Washington and the United States of America that the foregoing is true and correct and that I executed this Declaration on February 6, 2024, at San Francisco, California.

/s/ Joshua D. Dick
Joshua D. Dick

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EXHIBIT 1

IN THE SUPERIOR COURT OF THE STATE OF WASHINGTON
IN AND FOR THE COUNTY OF KING

SHOALWATER BAY INDIAN TRIBE,

Plaintiff,

v.

EXXON MOBIL CORPORATION, EXXONMOBIL OIL CORPORATION, BP P.L.C., BP AMERICA INC., CHEVRON CORPORATION, CHEVRON USA, INC., SHELL PLC, SHELL OIL COMPANY, CONOCOPHILLIPS, CONOCOPHILLIPS COMPANY, PHILLIPS 66, and PHILLIPS 66 COMPANY,

Defendants.

No. 23-2-25215-2 SEA

FIRST AMENDED SUMMONS

TO: EXXON MOBIL CORPORATION;
AND TO: EXXONMOBIL OIL CORPORATION,;
AND TO: BP P.L.C.;
AND TO: BP AMERICA INC.;
AND TO: CHEVRON CORPORATION;
AND TO: CHEVRON USA, INC.;
AND TO: SHELL PLC;
AND TO: SHELL OIL COMPANY;
AND TO: CONOCOPHILLIPS;
AND TO: CONOCOPHILLIPS COMPANY;
AND TO: PHILLIPS 66;
AND TO: PHILLIPS 66 COMPANY.

CORRIE YACKULIC LAW FIRM, PLLC
110 PREFONTAINE PLACE SOUTH, SUITE 304
SEATTLE, WASHINGTON 98104
TELEPHONE: (206) 787-1915 • FACSIMILE: (206) 299-9725

A lawsuit has been started against you in the above entitled court by SHOALWATER BAY INDIAN TRIBE. Plaintiff's claims are stated in the written Complaint, a copy of which is served upon you with this Summons.

In order to defend against the lawsuit, you must respond to the complaint by stating your defense in writing, and serve a copy upon the undersigned attorneys for the plaintiff within 20 days after the service of this Summons, or within 60 days if this Summons was served outside the State of Washington, excluding the day of service, or a default judgment may be entered against you without notice. A default judgment is one where the plaintiff is entitled to what they ask for because you have not responded. If you serve a notice of appearance on the undersigned attorneys, you are entitled to notice before a default judgment may be entered.

You may demand that the plaintiff file the lawsuit with the court. If you do so, the demand must be in writing and must be served upon the plaintiff. Within 14 days after the service of the demand, the plaintiff must file this lawsuit with the court, or the service on you of this Summons and Complaint will be void.

If you wish to seek the advice of an attorney in this matter, you should do so promptly so that your written response, if any, may be served on time.

This Summons is issued pursuant to Rule 4 of the Superior Court Civil Rules of the State of Washington.

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DATED this 20th day of December, 2023.

Respectfully submitted,

SHER EDLING LLP

/s/Corrie J. Yackulic
CORRIE J. YACKULIC, WSBA No. 16063
VICTOR M. SHER (*pro hac vice forthcoming*)
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Attorneys for Plaintiff, SHOALWATER BAY INDIAN TRIBE

IN THE SUPERIOR COURT OF THE STATE OF WASHINGTON
IN AND FOR THE COUNTY OF KING

SHOALWATER BAY INDIAN TRIBE,

Plaintiff,

v.

EXXON MOBIL CORPORATION, EXXONMOBIL OIL CORPORATION, BP P.L.C., BP AMERICA INC., CHEVRON CORPORATION, CHEVRON USA, INC., SHELL PLC, SHELL OIL COMPANY, CONOCOPHILLIPS, CONOCOPHILLIPS COMPANY, PHILLIPS 66, and PHILLIPS 66 COMPANY,

Defendants.

No. 23-2-25215-2 SEA

COMPLAINT FOR DAMAGES AND INJUNCTIVE RELIEF

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I. INTRODUCTION

1.1 For decades, ExxonMobil, BP, Shell, Chevron and ConocoPhillips ("Defendants") have misled consumers and the public about the central role of fossil fuels in causing climate change. Since at least the 1950s, their own scientists have consistently concluded that fossil fuels produce carbon dioxide and other greenhouse gas pollution that increases global temperatures, destabilizing the climate and causing catastrophic consequences for the planet and its people. The industry has taken these internal scientific findings seriously, investing heavily to protect its own assets and infrastructure from rising seas, stronger storms, and other climate change impacts. But rather than warn consumers and the public about these dangers, fossil fuel companies and their surrogates have for decades pushed disinformation to discredit the scientific consensus on climate change; to create doubt in the public's mind about the climate-disruptive impacts of burning fossil fuels; and to delay the energy economy's transition to a lower-carbon future. This successful climate deception campaign has had the purpose and effect of inflating and sustaining the market for fossil fuels, which—in turn—has driven up greenhouse gas emissions, accelerated global warming, and brought about devastating climate change impacts to the Shoalwater Bay Tribe and its reservation that continue unabated today.

1.2 Defendants' promotion and sale of fossil fuels has exploded since the Second World War, as have carbon dioxide ("CO_2") and other emissions from those products. Fossil fuel emissions—especially CO_2—are far and away the dominant driver of global warming.[1] The

[1] See Intergovernmental Panel on Climate Change ("IPCC"), *Summary for Policymakers in Climate Change 2021: The Physical Science Basis. Contribution of Working Group I in the Sixth Assessment Report* (2021), at 4–9, https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf.

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substantial majority of all anthropogenic (human-caused) greenhouse gas emissions in history have occurred from the 1950s to the present, a period known as the "Great Acceleration."[2] About three-quarters of all industrial CO_2 emissions in history have occurred since the 1960s,[3] and more than half have occurred since the late 1980s. The annual rate of CO_2 emissions from extraction, production, and consumption of fossil fuels has increased substantially since 1990.[4]

1.3 Defendants' awareness of the negative impacts of fossil fuel consumption almost exactly tracks the onset of the Great Acceleration. Defendants have known since at least the 1950s that fossil fuels produce carbon dioxide and other greenhouse gas ("GHG") pollution that would warm the planet and destabilize our climate. Defendants' own scientists advised the companies repeatedly, starting as early as the 1950s, that climate impacts could be catastrophic, and that only a narrow window of time existed in which to act before the consequences became catastrophic.

1.4 Rather than warn the public of these tremendous harms, however, Defendants mounted a disinformation campaign beginning as early as the 1970s to discredit the burgeoning scientific consensus on climate change; deny their own knowledge of climate change-related threats; create doubt about the reality and consequences of the impacts of burning fossil fuels; and delay the necessary transition to a lower-carbon future.

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[2] Will Steffen et al., *The Trajectory of the Anthropocene: The Great Acceleration*, 2 The Anthropocene Review 81, 81 (2015).

[3] R.J. Andres et al., *A Synthesis of Carbon Dioxide Emissions from Fossil-Fuel Combustion*, 9 Biogeosciences 1845, 1851 (2012).

[4] Global Carbon Project, *Global Carbon Budget 2021*, https://www.globalcarbonproject.org/global/images/carbonbudget/Infographic_Emissions2021.pdf.

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1.5 Defendants have further deceived customers and the public by misrepresenting the climate impacts of their products sold in Washington State and on the Shoalwater Bay Reservation. In a bid to reassure consumers that purchasing these products is good for the planet, Defendants advertise them as "cleaner," "emissions-reducing," and the like, while failing to disclose their harmful effects on the climate. This strategy is similar to the Tobacco industry's advertising playbook, which deceptively promoted "low tar" and "light" cigarettes as healthier smoking options, when the companies knew that any use of cigarettes was harmful. Defendants here likewise falsely present themselves as corporate leaders in the fight against climate change, claiming to invest substantially in low-emission technologies and zero-emission energy sources, while their businesses continue to focus overwhelmingly on fossil fuel production and sales.

1.6 Defendants' deceptive conduct and sophisticated promotion of fossil fuel products without warning of their dangers inflated and sustained demand for fossil fuels and forestalled the move to low- and no-carbon alternatives, resulting in billions of dollars in profits for Defendants.

1.7 Yet it is now the Shoalwater Bay Tribe and its citizens who are paying for the effects of Defendants' misconduct. The Tribe faces existential threats to its people and its land from climate change. The Tribe has already spent millions to deal with climate change-induced disasters and protect its assets from future harms, and will spend many hundreds of millions more. Climate-disruption impacts include those resulting from rising sea levels, heavier rainfall concentrated in fewer months, many more days with extreme heat, drier soil moisture levels, reduced low stream flow levels and elevated high stream flow levels, more frequent and damaging wildfire, more frequent and intense storms and drought, flooding and erosion, human

health effects, especially for the most vulnerable, and much more. The Tribe brings this lawsuit to hold Defendants accountable for their deceptive and unfair conduct, and to pay for the damage their deceptive conduct has caused and will cause for decades to come.[5]

II. PARTIES

A. Plaintiff

2.1. Plaintiff, the Shoalwater Bay Indian Tribe ("Shoalwater Bay Tribe" or "Tribe"), is a federally-recognized sovereign Native Nation that has occupied the lands and waters along and draining into Willapa Bay (also known as "Shoalwater Bay") in what is now the State of Washington for millennia. The Shoalwater Bay Reservation—a small slice of the Tribe's aboriginal territory that extended from Willapa Bay, northward to present day Westport then east up the Chehalis River to present day Satsop—was established by Executive Order of President Andrew Johnson on September 22, 1866 ("Executive Order Reservation"). As used herein, "Shoalwater Bay Reservation" includes this Executive Order Reservation, together with lands that the United States holds in trust for the Tribe near and contiguous to the Executive Order Reservation. The Tribe brings this action to vindicate its sovereign, proprietary, public trust, and parens patriae rights, to abate a public nuisance, and to recover for injuries to the Tribe's natural resources, property, and public health.

[5] Plaintiff hereby disclaims injuries arising on federal enclaves and those arising from Defendants' provision of non-commercial, specialized fossil fuel products to the federal government for military and national defense purposes. The Tribe seeks no recovery or relief attributable to these injuries.

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B. Defendants

2.2. This suit concerns the wrongful promotion, marketing, and sale of fossil fuels. Defendants Exxon Mobil Corporation, ExxonMobil Oil Corporation, BP P.L.C., BP America Inc., Chevron Corporation, Chevron USA, Inc., Shell plc, Shell Oil Company, ConocoPhillips, ConocoPhillips Company, Phillips 66, and Phillips 66 Company are multinational oil and gas companies that promote, market, and sell fossil fuels and fossil fuel-based products worldwide, including in Washington. All Defendants are either registered to do business in Washington or have wholly-owned subsidiaries registered to do business in Washington.

2.3. **Exxon Entities: Exxon Mobil Corporation, ExxonMobil Oil Corporation**

a. Defendant **Exxon Mobil Corporation** is a New Jersey corporation headquartered in Irving, Texas. Exxon Mobil Corporation is the parent company of numerous subsidiaries, which explore for, produce, refine, market, and sell fossil fuels worldwide. Exxon Mobil Corporation was formerly known as, did or does business as, and/or is the successor in liability to ExxonMobil Refining and Supply Company, Exxon Chemical U.S.A., ExxonMobil Chemical Corporation, ExxonMobil Chemical U.S.A., ExxonMobil Refining & Supply Corporation, Exxon Company, U.S.A., Exxon Corporation, Standard Oil Company (NJ), and Mobil Corporation.

b. Exxon Mobil Corporation controls and has controlled whether and to what extent it or its subsidiaries promote, market, or sell fossil fuels. This includes decisions related to climate change and greenhouse gas emissions, marketing its brand and fossil fuels, as well as strategic communications concerning climate change and the role of fossil fuels.

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c. Defendant **ExxonMobil Oil Corporation** is a New York corporation headquartered in Irving, Texas. ExxonMobil Oil Corporation is a wholly owned subsidiary of Exxon Mobil Corporation that acts on Exxon Mobil Corporation's behalf and is subject to Exxon Mobil Corporation's control. ExxonMobil Oil Corporation was formerly known as, did or does business as, and/or is the successor in liability to Mobil Oil Corporation.

d. Defendants Exxon Mobil Corporation, ExxonMobil Oil Corporation, and their predecessors, successors, parents, subsidiaries, affiliates, and divisions, are collectively referred to herein as "Exxon."

2.4. **BP Entities: BP P.L.C., BP America Inc.**

a. Defendant **BP P.L.C.** is registered in England and Wales with its principal place of business in London. BP P.L.C. is the parent company of numerous subsidiaries, which explore for, produce, refine, market, and sell fossil fuels worldwide. BP P.L.C. was formerly known as, did or does business as, and/or is the successor in liability to British Petroleum.

b. BP P.L.C. controls and has controlled whether and to what extent it or its subsidiaries promote, market, or sell fossil fuels. This includes decisions related to climate change and greenhouse gas emissions, marketing its brand and fossil fuels, as well as strategic communications concerning climate change and the role of fossil fuels. BP owns the Cherry Point Refinery in Whatcom County, the largest oil refinery in Washington State.

c. Defendant **BP America Inc.** is a Delaware corporation headquartered in Houston, Texas. BP America is a wholly owned subsidiary of BP P.L.C. that acts on BP P.L.C.'s behalf and is subject to BP P.L.C.'s control. BP America Inc. was formerly known as, did or does business as, and/or is the successor in liability to Amoco Corporation, Amoco Oil

Company, ARCO Products Company, Atlantic Richfield Washington Corporation, Atlantic Richfield Company (a Delaware Corporation), BP Exploration & Oil, Inc., BP Products North America Inc., BP Amoco Corporation, BP Amoco Plc, BP Oil, Inc., BP Oil Company, Sohio Oil Company, Standard Oil of Ohio (SOHIO), Standard Oil (Indiana), and The Atlantic Richfield Company (a Pennsylvania Corporation) and its division, the Arco Chemical Company.

d. Defendants BP P.L.C. and BP America, Inc., together with their predecessors, successors, parents, subsidiaries, affiliates, and divisions, are collectively referred to herein as "BP."

2.5. **Chevron Entities: Chevron Corporation, Chevron USA, Inc.**

a. Defendant **Chevron Corporation** is a Delaware corporation headquartered in San Ramon, California. Chevron Corporation is the parent company of numerous subsidiaries, which explore for, produce, refine, market, and sell fossil fuels worldwide.

b. Chevron Corporation controls and has controlled whether and to what extent it or its subsidiaries promote, market, or sell fossil fuels. This includes decisions related to climate change and greenhouse gas emissions, marketing of its brand and fossil fuels, as well as strategic communications concerning climate change and the role of fossil fuels.

c. Defendant **Chevron U.S.A. Inc.** is a Pennsylvania corporation headquartered in San Ramon, California. Chevron U.S.A. Inc. is a wholly owned subsidiary of Chevron Corporation that acts on Chevron Corporation's behalf and is subject to Chevron Corporation's control. Chevron U.S.A. Inc. was formerly known as, did or does business as,

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and/or is the successor in liability to Gulf Oil Corporation, Gulf Oil Corporation of Pennsylvania, Chevron Products Company, and Chevron Chemical Company.

d. Defendants Chevron Corporation and Chevron U.S.A. Inc., together with their predecessors, successors, parents, subsidiaries, affiliates, and divisions, are collectively referred to herein as "Chevron."

2.6. **Shell Entities: Shell plc, Shell Oil Company**

a. Defendant **Shell plc** (formerly Royal Dutch Shell PLC) is incorporated in England and Wales, headquartered in The Hague, Netherlands. Shell plc is the parent company of numerous divisions, subsidiaries, and affiliates, referred to collectively as the "Shell Group," that engage in all aspects of the fossil fuel industry including exploration, development, extraction, manufacturing and energy production, transport, trading, marketing, and sales.

b. Shell plc controls and has controlled whether and to what extent it or its subsidiaries promote, market, or sell fossil fuels. This includes decisions related to climate change and greenhouse gas emissions, marketing its brand and fossil fuels, as well as strategic communications concerning climate change and the role of fossil fuels. Shell owned and operated the Shell Anacortes Refinery in Whatcom County prior to 1998, and the Puget Sound Refinery in Skagit County from 1998 to 2021.

c. Defendant **Shell Oil Company** is a Delaware corporation headquartered in Houston, Texas. Shell Oil Company is a wholly owned subsidiary of Shell plc that acts on Shell plc's behalf and is subject to Shell plc's control. Shell Oil Company was formerly known as, did or does business as, and/or is the successor in liability to Deer Park Refining LP, Shell Oil, Shell Oil Products, Shell Chemical, Shell Trading US, Shell Trading (US) Company, Shell

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Energy Services, Texaco Inc., The Pennzoil Company, Shell Oil Products Company LLC, Shell Oil Products Company, Star Enterprise, LLC, and Pennzoil-Quaker State Company.

d. Defendants Shell plc, Shell Oil Company, and their predecessors, successors, parents, subsidiaries, affiliates, and divisions are collectively referred to herein as "Shell."

2.7. **ConocoPhillips Entities: ConocoPhillips, ConocoPhillips Company, Phillips 66, Phillips 66 Company**

a. Defendant **ConocoPhillips** is incorporated in Delaware and has its principal place of business in Houston, Texas. ConocoPhillips consists of numerous divisions, subsidiaries, and affiliates that execute ConocoPhillips's fundamental decisions related to all aspects of the fossil fuel industry, including exploration, extraction, production, manufacture, transport, and marketing.

b. ConocoPhillips controls and has controlled whether and to what extent it or its subsidiaries promote, market, or sell fossil fuels. This includes decisions related to climate change and greenhouse gas emissions, marketing its brand and fossil fuels, as well as strategic communications concerning climate change and the role of fossil fuels. ConocoPhillips's most recent annual report subsumes the operations of the entire ConocoPhillips group of subsidiaries under its name. ConocoPhillips has developed and purportedly implements a corporate Climate Change Action Plan to govern climate change decision making across all entities in the ConocoPhillips group.

c. Defendant **ConocoPhillips Company** is a wholly owned subsidiary of ConocoPhillips that acts on ConocoPhillips's behalf and is subject to ConocoPhillips's control.

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ConocoPhillips Company is incorporated in Delaware and has its principal office in Bartlesville, Oklahoma. ConocoPhillips Company is registered to do business in Washington.

d. Defendant **Phillips 66** is incorporated in Delaware and has its principal place of business in Houston, Texas. It encompasses downstream fossil fuel processing, refining, transport, and marketing segments that were formerly owned and/or controlled by ConocoPhillips. Phillips 66 owns the Ferndale Refinery in Whatcom County.

e. Defendant **Phillips 66 Company** is a wholly owned subsidiary of Phillips 66 that acts on Phillips 66's behalf and is subject to Phillips 66's control. Phillips 66 Company is incorporated in Delaware and has its principal office in Houston, Texas. Phillips 66 Company is registered to do business in Washington. Phillips 66 Company was formerly known as, did or does business as, and/or is the successor in liability to Phillips Petroleum Company, Conoco, Inc., Tosco Corporation, and Tosco Refining Co.

f. Defendants ConocoPhillips, ConocoPhillips Company, Phillips 66, and Phillips 66 Company and their predecessors, successors, parents, subsidiaries, affiliates, and divisions are referred to herein as "ConocoPhillips."

2.8. When this Complaint references an act or omission of Defendants, unless specifically attributed or otherwise stated, such references should be interpreted to mean that the officers, directors, agents, employees, or representatives of Defendants committed or authorized such an act or omission, or failed to adequately supervise or properly control or direct their employees while engaged in the management, direction, operation or control of the affairs of Defendants, and did so while acting within the scope of their employment or agency.

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III. JURISDICTION AND VENUE

3.1. This Court has subject matter jurisdiction as this action arises within the Shoalwater Bay Reservation within the State of Washington and this Court is a court of general jurisdiction.

3.2. This Court has personal jurisdiction over Defendants pursuant to RCW 4.28.185(1)(a)-(b) and RCW 19.86.160 because this complaint arises out of business transacted in Washington and tortious conduct directed at Washington residents, including the Tribe and its citizens.

3.3. Each Defendant is transacting or has transacted substantial business in Washington; is contracting or has contracted to supply services or things in Washington; has or does derive substantial revenue in Washington or engages in a persistent course of conduct in Washington; had or has interests in, used or uses, or possessed or possesses real property in Washington; and/or caused tortious injury in Washington and has intentionally engaged in conduct aimed at Washington, which has caused harm they knew was likely to be incurred in Washington, including on the Shoalwater Bay Reservation. Each Defendant has sufficient contacts with Washington to give rise to the current action, has continuous and systematic contacts with Washington, and/or has consented either explicitly or implicitly to the jurisdiction of this Court.

3.4. A significant amount of Defendants' fossil fuels are or have been transported, refined, distributed, promoted, marketed, sold, and/or consumed in Washington, including on the Shoalwater Bay Reservation, from which Defendants derive and have derived substantial revenue. Defendants—directly and through their subsidiaries and/or predecessors-in-interest—

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supplied substantial quantities of fossil fuels to Washington State during the period relevant to this litigation. Defendants also market and sell petroleum products, including engine lubricants and motor oils, in Washington, including on the Shoalwater Bay Reservation, through local retailers.

3.5. Hundreds of Defendant-branded gas stations serve Washington consumers in the state. Through their various agreements with dealers, franchises, or otherwise, Defendants direct and control the branding, marketing, sales, promotions, image development, signage, and advertising of their branded fossil fuels at their respectively branded gas stations in Washington, including point-of-sale advertising and marketing. Defendants dictate which grades and formulations of their gasoline may be sold at their respectively branded stations. Defendants also maintain websites to direct Washington residents to their nearby retail service stations.

3.6. Defendants have purposefully directed and continue to purposefully direct their tortious conduct toward Washington by distributing, marketing, advertising, promoting, and supplying fossil fuels in Washington, with knowledge that fossil fuels have caused and will continue to cause climate crisis-related injuries in Washington, including in and on the Shoalwater Bay Reservation.

3.7. Over the past several decades, Defendants, directly and through their surrogates, have spent millions of dollars on radio, television, outdoor advertisements, and social media sites in the Washington market related to their fossil fuels. As just one example, a December 12, 2003 Op-Ed in the Seattle *Post-Intelligencer,* authored by former API and Global Climate Coalition executive William O'Keefe, claimed the "science of climate change" was "far from settled," relying on a "review" by Willie Soon, who was later exposed as receiving millions of dollars in

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funding from the oil and gas industry, including at least some of the Defendants here. In the Op-Ed, O'Keefe asserts, falsely, that "Neither I nor anyone else knows whether climate over the course of this century will be a scientific curiosity or a serious ecological threat," when it was well known for years, throughout the fossil fuel industry, that climate change posed a "serious ecological threat." Since the 1970's and continuing today, Defendants have also advertised in print publications circulated widely to Washington consumers, including but not limited to: The Atlantic, The Economist, Fortune Magazine, The New York Times, People, Sports Illustrated, Time Magazine, The Washington Post, Newsweek, and The Wall Street Journal.

3.8. As described below, Defendants' advertising campaigns have concealed and misled consumers about the role of fossil fuels in causing climate change and failed to warn consumers about those hazards. That conduct was and is intended to increase use of fossil fuels in and outside Washington, resulting in the Tribe's injuries.

3.9. Further, as described below, Defendants knew or should have known—based on information passed to them from their internal research divisions, affiliates, trade associations, and industry groups—that their actions in Washington, including on the Shoalwater Bay Reservation, and elsewhere would result in these injuries to the Tribe. The climate effects described herein are direct and foreseeable results of Defendants' conduct, collectively and individually.

3.10. Venue is proper in King County pursuant to RCW 4.12.020 and 4.12.025, and Superior Court Civil Rule 82, because Defendants transact business in King County.

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IV. FACTS

4.1. Part A provides background on the role of fossil fuels in causing global warming. Part B describes Defendants' knowledge, dating back many decades, that continued use of fossil fuels would cause severe harm in Washington, including on the Shoalwater Bay Reservation, and elsewhere. Part C describes how Defendants not only concealed this information from the public, but affirmatively worked to deny or discredit it. Defendants simultaneously acted on that same information to protect their own assets and future profits from the sale of fossil fuels. Part D describes how, to this day, Defendants continue to mislead the public by falsely claiming they offer clean and green fossil fuel products, and are leaders in the transition to clean energy. Part E describes how alternative energy technologies could have replaced or significantly reduced fossil fuel dependence. Part F describes how Defendants' tortious actions are a proximate cause of the Tribe's harms. Part G describes the Tribe's harms, which include damage to property, damage to and loss of natural resources and adverse public health effects.

A. Fossil fuel use since the 1960s accounts for most greenhouse gasses in the atmosphere that are causing global warming

4.2. Producing and consuming fossil fuels releases carbon dioxide, methane, and other pollutants into the atmosphere. Called "greenhouse gasses," these pollutants trap heat in the atmosphere, causing global warming. Carbon dioxide is the most prevalent greenhouse gas, while methane is responsible for a third of the warming the Earth has experienced thus far.

4.3. As the below graph illustrates, consuming fossil fuels is the principal cause of human emissions of carbon dioxide since the 1950's:

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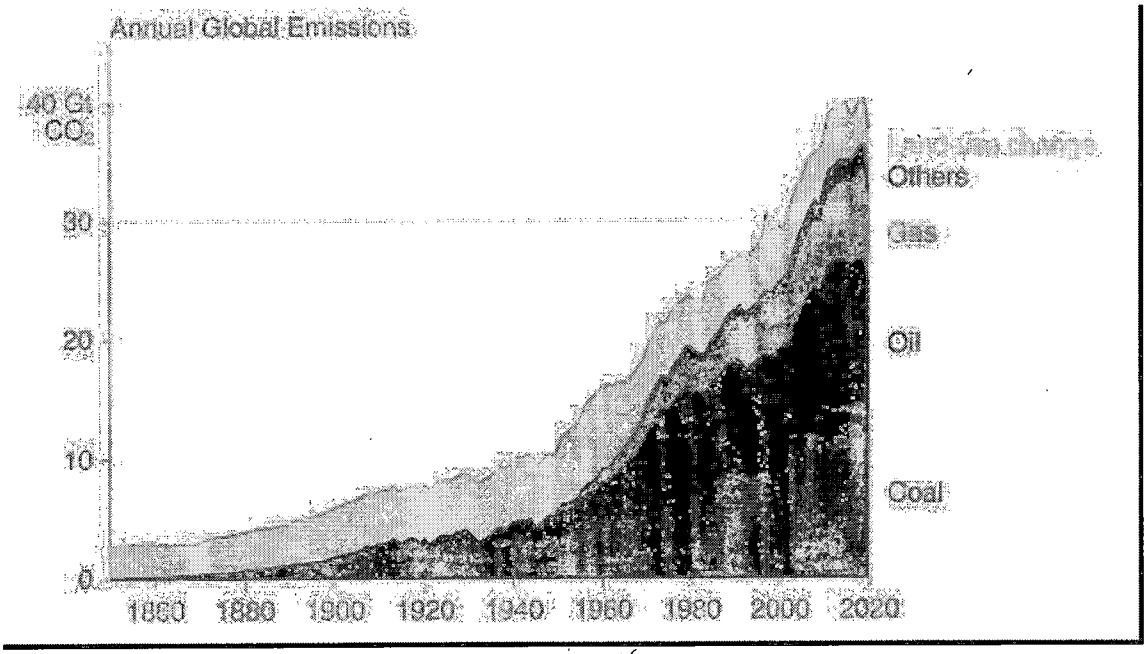

Figure 1: Annual Global Emissions, 1850–2020[6]

4.4. Increased emissions from fossil fuel consumption has led to an increase in the concentration of carbon dioxide in the Earth's atmosphere. Since 1960, carbon levels in the atmosphere spiked from under 320 parts per million ("ppm") to approximately 419 ppm.[7] From 1960 to 1970, atmospheric CO_2 increased by an average of approximately 1 ppm per year. Over the last five years, it has increased by around 2.5 ppm per year.[8] In other words, as the world consumes more and more fossil fuels, carbon dioxide levels increase at a faster rate. This traps

[6] Global Carbon Project, Global Carbon Budget 2021 83 (Nov. 4, 2021), https://www.globalcarbonproject.org/carbonbudget/archive/2021/GCP_CarbonBudget_2021.pdf

[7] Global Monitoring Laboratory, Trends in Atmospheric Carbon Dioxide, NOAA (last visited Sept. 30, 2022), https://gml.noaa.gov/dv/data/?parameter_name=Carbon%2BDioxide&type=Insitu

[8] Global Monitoring Laboratory, Trends in Atmospheric Carbon Dioxide, NOAA (last visited Sept. 30, 2022), https://gml.noaa.gov/dv/data/?parameter_name=Carbon%2BDioxide&type=Insitu

ever more heat in the atmosphere and increases the Earth's temperature at a faster pace and to a greater extent.

4.5. The graph below illustrates how the rise in human emissions of carbon dioxide is connected to the rise of carbon dioxide levels in the atmosphere:

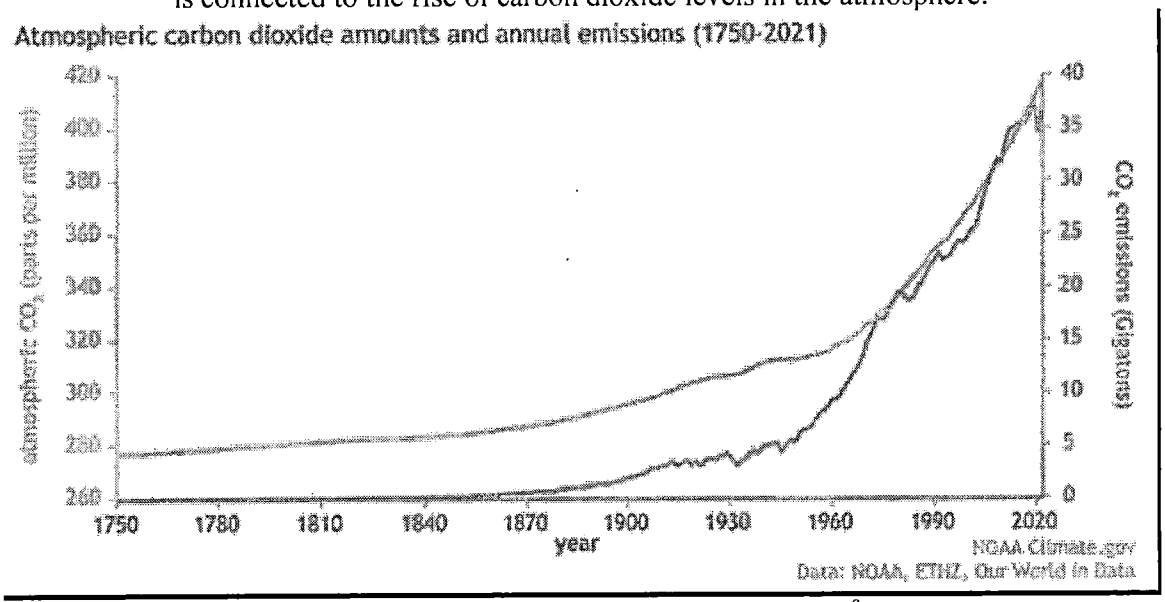

Figure 2: Atmospheric CO_2 Concentration and Annual Emissions[9]

4.6. Concentrations of greenhouse gases in the atmosphere are now at the highest level in at least three million years.[10]

4.7. Greenhouse gasses prevent heat from the sun from being radiated back into space. As greenhouse gases accumulate in the atmosphere, they trap more heat. The rise in greenhouse gasses is leading to a rise in global mean temperatures.

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[9] Rebecca Lindsey, Climate Change: Atmospheric Carbon Dioxide, NOAA (June 23, 2022), https://www.climate.gov/news-features/understanding-climate/climate-change-atmospheric-carbon-dioxide.

[10] Science Daily, More CO_2 Than Ever Before in 3 Million Years, Shows Unprecedented Computer Simulation (Apr. 3, 2019), https://www.sciencedaily.com/releases/2019/04/190403155436.htm.

4.8. Global warming has contributed to increasingly devastating wildfires, flooding, droughts, rising temperatures and sea levels, and ocean acidification to the harm and detriment of the Shoalwater Bay Reservation. The health of the citizens of the Shoalwater Bay Tribe has also suffered and will suffer from extreme heat and extreme weather, worsened air quality, and vector-borne illnesses.

4.9. According to the climate impacts group at the University of Washington, with global warming of at least 1.5 degrees Celsius, by 2050, Washington, including the Shoalwater Bay Reservation, is projected to experience:

a. A 67 percent increase in the number of days per year above ninety degrees Fahrenheit, relative to 1976-2005, leading to an increased risk of heat-related illness and death, warmer streams, and more frequent algal blooms;

b. A decrease of thirty-eight percent in the snowpack, relative to 1970-1999, leading to reduced water storage, irrigation shortages, and winter and summer recreation losses;

c. An increase of sixteen percent in winter streamflow, relative to 1970-1999, leading to an increased risk of river flooding;

d. A decrease of twenty-three percent in summer streamflow, relative to 1970-1999, leading to reduced summer hydropower, conflicts over water resources, and negative effects on salmon populations; and

e. An increase of one and four-tenths feet in sea level, relative to 1991-2010, leading to coastal flooding and inundation, damage to coastal infrastructure, and bluff erosion.[11]

[11] WASH. REV. CODE § 70A.45.020, Intent - 2020 c 79 (2020). Snover, A.K., C.L. Raymond, H.A. Roop, H. Morgan, 2019. No Time to Waste. The Intergovernmental Panel on Climate Change's Special Report on Global Warming of 1.5°C and Implications for Washington State. Briefing paper prepared by the Climate Impacts Group, University of Washington, Seattle.

4.10. As the next sections describe, most emissions from increasing consumption of fossil fuels have occurred *since* Defendants knew that fossil fuels would cause such harms, yet Defendants did not warn consumers about these risks. Instead, Defendants worked to deceive the public about the role of fossil fuels in causing climate change in order to protect their profits.

B. Defendants have known that fossil fuels would cause catastrophic climate change since at least 1959.

4.11. Defendants studied the effects of fossil fuel combustion on climate for decades, developing a sophisticated understanding of climate disruption due to fossil fuel use that far exceeded the knowledge of ordinary consumers.

4.12. Defendants knew climate change posed a risk to their fossil fuel business. Internal documents regularly mention these risks.

4.13. In 1954, the American Petroleum Institute (API), the industry's main trade association, learned from geochemist Harrison Brown and his colleagues at the California Institute of Technology that fossil fuels had caused atmospheric carbon dioxide levels to increase by about 5% since 1840.[12] API continued to fund measurements of carbon dioxide levels after that, but did not share the results publicly.[13]

4.14. In 1957, Humble Oil (predecessor-in-interest to ExxonMobil) measured an increase in atmospheric carbon dioxide similar to that measured by Harrison Brown and shared the results with API.

Updated 02/2019. https://cig.uw.edu/wp-content/uploads/sites/2/2019/02/NoTimeToWaste_CIG_Feb2019.pdf

[12] See Benjamin Franta, Early Oil Industry Knowledge of CO_2 and Global Warming, 8 Nature Climate Change 1024, 1024–25 (2018).

[13] *Id.*

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4.15. In 1959, nuclear physicist Edward Teller warned API members, including Defendants, that "a temperature rise corresponding to a 10[%] increase in carbon dioxide will be sufficient to melt the icecap and submerge . . . [a]ll the coastal cities . . . this chemical contamination is more serious than most people tend to believe."[14]

4.16. In 1965, President Lyndon B. Johnson's Science Advisory Committee reported that burning fossil fuels was adding carbon dioxide to the Earth's atmosphere and could lead to uncontrollable and significant changes in the Earth's climate, and rapid sea-level rise.[15]

4.17. API promptly discussed this report with its members, stating: "[t]he substance of the report is that there is still time to save the world's peoples from the catastrophic consequence of pollution, but time is running out."[16] API's President emphasized the report's finding that "the pollution from internal combustion engines is so serious, and is growing so fast, that an alternative nonpolluting means of powering automobiles, buses, and trucks is likely to become a national necessity."[17]

4.18. API subsequently commissioned research on carbon dioxide pollution from the Stanford Research Institute.[18] In 1968, the SRI scientists informed API that "[p]ast and present studies of CO_2 are detailed and seem to explain adequately the present state of CO_2 in the

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[14] Edward Teller, Energy Patterns of the Future, in Energy and Man: A Symposium 53–72 (1960).

[15] President's Science Advisory Committee, Restoring the Quality of Our Environment: Report of the Environmental Pollution Panel 9, 119–24 (Nov. 1965), https://hdl.handle.net/2027/uc1.b4315678.

[16] See Franta, Early Oil Industry Knowledge of CO_2 and Global Warming at 1024–25.

[17] Id.

[18] Elmer Robinson & R.C. Robbins, Sources, Abundance, and Fate of Gaseous Atmospheric Pollutants, Stanford Rsch. Inst. (Feb. 1968), https://www.smokeandfumes.org/documents/document16.

atmosphere." They warned there was "no doubt" that the "potential damage to our environment could be severe."[19]

4.19. In a supplemental report the next year (1969), the Stanford Research Institute projected that, if present fossil fuel consumption trends continued, the concentration of carbon dioxide in the atmosphere would reach 370 parts per million ("ppm") by 2000. The report explicitly connected the rise in CO_2 levels to the combustion of fossil fuels, finding it "unlikely that the observed rise in atmospheric CO_2 has been due to changes in the biosphere." The scientists' projection was accurate. In 2000, the concentration of carbon dioxide in the atmosphere was 369.64 ppm.[20]

4.20. API shared this research with Defendants.

4.21. Exxon also researched climate science. In the 1970s and 1980s, Exxon scientists confirmed that burning fossil fuels was the dominant source of carbon dioxide pollution and accurately predicted future concentrations of carbon dioxide and the associated rise in temperature. They briefed management at the highest levels of their findings.

4.22. In 1977, James Black, an Exxon scientist, briefed Exxon management that "current scientific opinion overwhelmingly favors attributing atmospheric carbon dioxide increase to fossil fuel consumption," and doubling atmospheric carbon dioxide would, according

[19] Elmer Robinson & R.C. Robbins, Sources, Abundance, and Fate of Gaseous Atmospheric Pollutants Supplement, Stanford Rsch. Inst. (June 1969).

[20] NASA Goddard Institute for Space Studies, Global Mean CO_2 Mixing Ratios (ppm): Observations, https://data.giss.nasa.gov/modelforce/ghgases/Fig1A.ext.txt.

to the best climate model available, "produce a mean temperature increase of about 2°C to 3°C" by 2050.[21] Black illustrated this outcome for management:

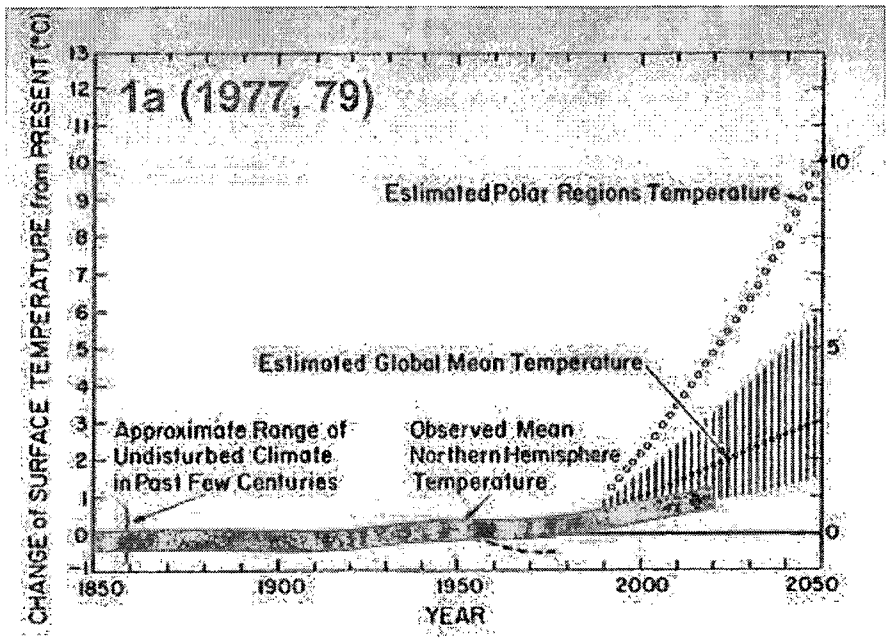

Figure 3: Future Global Warming Predicted Internally by Exxon in 1977[22]

Black's predictions were correct. In 2023, independent researchers added the red line to Black's graph, showing that the observed change in temperature closely tracked his 1977 prediction.[23]

4.23. Black reported to management that projected future fossil fuel use would lead to serious damage, including "more rainfall" that could reduce or destroy the agricultural output of

[21] Letter from J.F. Black, Exxon Research and Engineering Co., to F.G. Turpin, Exxon Research and Engineering Co., The Greenhouse Effect, ClimateFiles (June 6, 1978), http://www.climatefiles.com/exxonmobil/1978-exxon-memo-on-greenhouse-effect-for-exxon-corporation-management-committee.

[22] Id. The company predicted global warming of 3°C by 2050, with 10°C warming in polar regions. The difference between the dashed and solid curves prior to 1977 represents global warming that Exxon believed may already have been occurring.

[23] G. Supran et al., Assessing ExxonMobil's global warming projections. Science 379, eabk0063(2023). DOI:10.1126/science.abk0063. https://www.science.org/doi/10.1126/science.abk0063

some countries. Black highlighted the need to make "hard decisions regarding changes in energy strategies" in the next 5-10 years (i.e., before 1987) to avoid these harms.[24]

4.24. In 1979, a confidential Exxon memorandum stated "[t]he most widely held theory [about climate change] is that:

- **The increase is due to fossil fuel combustion**
- **Increasing CO_2 concentration will cause a warming of the earth's surface**
- **The present trend of fossil fuel consumption will cause dramatic environmental effects before the year 2050.**

4.25. The memo highlighted that there was "no practical means" to capture and store carbon emissions and so "dramatic changes in patterns of energy use would be required" to avoid environmental damage. Significantly, the memo said that in order to limit CO_2 emissions to avoid these harms, fossil fuel emissions would have to peak in the 1990s and alternative energies would need to be rapidly deployed. Eighty percent of fossil fuel resources would remain undeveloped; thus "coal and possibly other fossil fuel resources could not be utilized to an appreciable extent." Certain fossil fuels, such as shale oil, could not be substantially exploited at all.[25]

4.26. Defendants did not follow this path. They developed and refined techniques to recover shale oil, leading to the shale oil and gas boom in the late 2000s.[26] And carbon dioxide

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[24] Id.

[25] Letter from W.L. Ferrall, Exxon Research and Engineering Co., to Dr. R.L. Hirsch, Controlling Atmospheric CO_2, Climate Investigations Ctr. (Oct. 16, 1979), https://www.industrydocuments.ucsf.edu/docs/mqwl0228.

[26] Rapier, Robert. How the Shale Boom Turned the World Upside Down. (April 21, 2017), https://www.forbes.com/sites/rrapier/2017/04/21/how-the-shale-boom-turned-the-world-upside-down/?sh=1a721ec677d2.

levels reached 400 ppm in 2015, just five years later than the date Exxon had predicted back in 1979.[27]

4.27. In 1979, API and its members, including all Defendants, convened a Task Force to monitor and share cutting edge climate research among the oil industry and to evaluate the implications for their fossil fuel businesses.[28]

4.28. API prepared a background paper on carbon dioxide and climate for the Task Force, stating that carbon levels were rising steadily and would cause global warming. However, the effects of global warming would likely go undetected until 2000 due to a natural cooling trend.[29]

4.29. In 1980, API's Task Force met with Dr. John Laurmann, "a recognized expert in the field of CO_2 and climate," for seven hours.[30] Laurmann told the Task Force there was "strong empirical evidence" that rising carbon levels were mainly due to burning fossil fuels and there was a "scientific consensus" that increased carbon levels could cause "large future climatic response[s]." Laurmann projected the following:

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[27] Nicola Jones, How the World Passed a Carbon Threshold and Why It Matters, Yale Env't 360 (Jan. 26, 2017), http://e360.yale.edu/features/how-the-world-passed-a-carbon-threshold-400ppm-and-why-it-matters.

[28] Neela Banerjee, Exxon's Oil Industry Peers Knew About Climate Dangers in the 1970s, Too, Inside Climate News (Dec. 22, 2015), https://insideclimatenews.org/news/22122015/exxon-mobil-oil-industry-peers-knew-about-climate-change-dangers-1970s-american-petroleum-institute-api-shell-chevron-texaco.

[29] Memorandum from R.J. Campion to J.T. Burgess, The API's Background Paper on CO_2 Effects, Climate Investigations Ctr. (Sep. 6, 1979), https://www.industrydocuments.ucsf.edu/docs/lqwl0228.

[30] Letter from Jimmie J. Nelson, American Petroleum Institute, to AQ-9 Task Force, The CO2 Problem: Addressing Research Agenda Development, Climate Investigations Ctr. (Mar. 18, 1980), https://www.industrydocuments.ucsf.edu/docs/gffl0228.

LIKELY IMPACTS:

1°C RISE (2005): BARELY NOTICEABLE

2.5°C RISE (2038): MAJOR ECONOMIC CONSEQUENCES, STRONG REGIONAL DEPENDENCE

5°C RISE (2067): GLOBALLY CATASTROPHIC EFFECTS

4.30. Laurmann also explained that, while some uncertainty remains, if achieving high market penetration for new energy sources would require a long time, there was "no leeway" for delay. The Task Force planned to research the "market penetration requirements of introducing a new energy source into worldwide use."[31]

4.31. In 1980, Imperial Oil Limited, an Exxon subsidiary, reported to managers and environmental staff at multiple affiliated Esso and Exxon companies that there was "no doubt" that fossil fuels were aggravating the build-up of CO_2 in the atmosphere.[32] Further, while it was possible to capture carbon emitted from power plants, "removal of only 50% of the CO_2 would double the cost of power generation."[33]

4.32. In 1980, an Exxon manager, Henry Shaw, briefed management on the "CO_2 Greenhouse Effect."[34] Shaw's briefing stated that burning fossil fuels was increasing carbon dioxide levels and this would "most likely" result in global warming of approximately 3°C around the year 2060. Calculations predicting a lower temperature increase were "not held in

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[31] Id.

[32] Imperial Oil Ltd., Review of Environmental Protection Activities for 1978–1979 (Aug. 6, 1980), http://www.documentcloud.org/documents/2827784-1980-Imperial-Oil-Review-of-Environmental.html#document/p2.

[33] Id.

[34] Memorandum from Henry Shaw to T.K. Kett, Exxon Research and Engineering Company's Technological Forecast: CO_2 Greenhouse Effect (Dec. 18, 1980), https://www.documentcloud.org/documents/2805573-1980-Exxon-Memo-Summarizing-Current-Models-And.html.

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high regard by the scientific community." While the oceans could absorb some heat, that could delay (but not prevent) the temperature increase "by a few decades." Natural climate fluctuations would hide global warming from carbon emissions until around the year 2000. The future impacts, however, would be "dramatic," including greater rainfall, reduced agricultural output, and sea level rise. The memo included the following illustration, showing that significant global warming will have already occurred before it exceeded the range of natural "climatic noise":

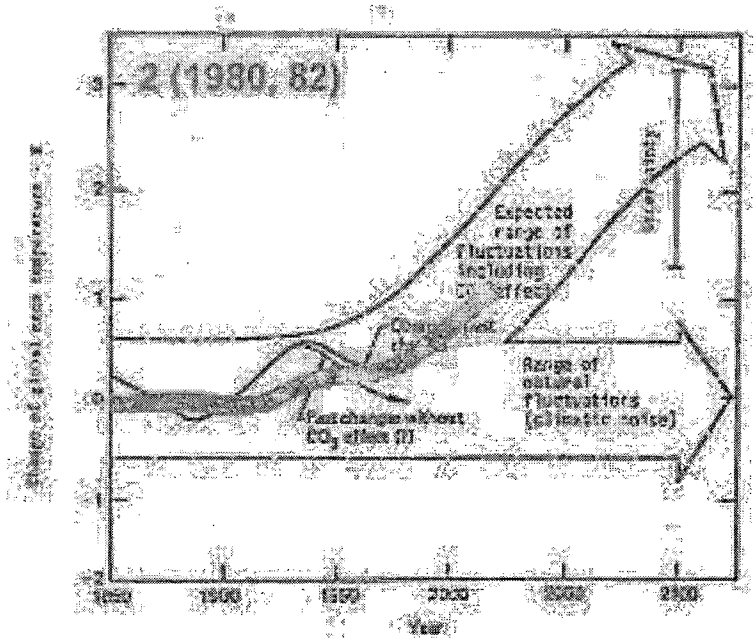

Figure 4: Future Global Warming Predicted Internally by Exxon in 1980[35]

The red line indicates actual observed temperatures following the report.[36]

[35] Id. The company anticipated a doubling of carbon dioxide by around 2060 and that the oceans would delay the warming effect by a few decades, leading to approximately 3°C warming by the end of the century.

[36] G. Supran et al., Assessing ExxonMobil's global warming projections. Science 379, eabk0063(2023). DOI:10.1126/science.abk0063. https://www.science.org/doi/10.1126/science.abk0063

4.33. Shaw also reported on Exxon's research into "the market penetration of non-fossil fuel technologies," and reported that, all other things being equal, alternative energy "would need about 50 years to penetrate and achieve roughly half of the total [energy] market."[37]

4.34. Also in 1980, the head of Exxon's Research and Engineering Company wrote to Exxon's Senior Vice President, stating in part that: "the greenhouse effect is receiving widespread attention based in part on dramatic claims and dire predictions that are appearing in the popular press. It is being cited, for instance, as an argument in opposition to any major U.S-synfuels program. . . Our data could well influence Exxon's view about the long-term attractiveness of coal and synthetics relative to nuclear and solar energy."[38]

4.35. In 1981, Exxon staff sent an internal "Scoping Study on CO_2" to management.[39] The study describes Exxon's motivations for engaging in climate research. Exxon intended to closely monitor outside research for its own "planning," acknowledging that predictions of climate models will influence public perception of the problem. Exxon also sought to "enhance the Exxon image and build public relations value." The study recommends against expanding the climate research program because the current research program was already meeting these goals, noting there was not a current threat to Exxon's business from legislation. However, because the cost to capture and store carbon was "exorbitant," "[e]nergy conservation or shifting to renewable energy sources[] represent the only options that might make sense" in the future.[40]

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[37] Id.
[38] Exxon's View and Position on "Greenhouse Effect." (Jan. 29, 1980) https://insideclimatenews.org/wp-content/uploads/2015/09/Letters-to-Senior-VPS-1980.pdf.
[39] Letter from G.H. Long, Exxon Research and Engineering Co., to P.J. Lucchesi et al., Atmospheric CO_2 Scoping Study, Climate Investigations Ctr. (Feb. 5, 1981), https://www.industrydocuments.ucsf.edu/docs/yxfl0228.
[40] Id.

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4.36. Also in 1981, Exxon scientist Roger Cohen warned his colleagues that Exxon's predictions of future climate impacts "based only on our knowledge of availability and economics [of fossil fuel consumption] become hazardous." Such a scenario would "produce effects which will indeed be catastrophic (at least for a substantial fraction of the world's population)."[41]

4.37. In 1981, Exxon stated its position on the growth of carbon dioxide in the atmosphere. According to Exxon, growing fossil fuel consumption will lead atmospheric CO2 levels to double, and doubling CO2 levels will lead to a global average temperature rise of 3°C. This will cause "[m]ajor shifts in rainfall/agriculture" and "polar ice may melt."[42]

4.38. In 1982, API commissioned a report from scientists at Columbia University. The report found that, despite differences in climate model predictions, there was a scientific consensus that doubling carbon levels in the atmosphere would result in an average global temperature rise of about 3°C. The scientists told API that "[s]uch a warming can have serious consequences for man's comfort and survival since patterns of aridity and rainfall can change,

[41]Memorandum from R.W. Cohen to W. Glass, ClimateFiles (Aug. 18, 1981), http://www.climatefiles.com/exxonmobil/1981-exxon-memo-on-possible-emission-consequences-of-fossil-fuel-consumption.

[42] Memorandum from Henry Shaw to Dr. E.E. David, CO_2 Position Statement, Inside Climate News (May 15, 1981) (footnote omitted), https://insideclimatenews.org/documents/exxon-position-co2-1981.

the height of the sea level can increase considerably and the world food supply can be affected."[43] Exxon's independent research also confirmed this.[44]

4.39. In a confidential primer[45] on climate change that Exxon circulated to management in 1982, Exxon illustrated how future fossil fuel use would lead carbon levels to rise, along with global temperatures:

[43] American Petroleum Institute, Climate Models and CO2 Warming: A Selective Review and Summary (Columbia Univ., Mar. 1982), https://assets.documentcloud.org/documents/2805626/1982-API-Climate-Models-and-CO2-Warming-a.pdf.

[44] See Memorandum from Roger W. Cohen, Exxon Research and Engineering Co., to A.M. Natkin, Exxon Corp. Office of Science and Technology, ClimateFiles (Sept. 2, 1982), http://www.climatefiles.com/exxonmobil/1982-exxon-memo-summarizing-climate-modeling-and-co2-greenhouse-effect-research (discussing research articles and summarizing the findings of research in climate modeling).

[45] Memorandum from M.B. Glaser, CO_2 "Greenhouse" Effect, Exxon Research and Engineering Company (Nov. 12, 1982), https://insideclimatenews.org/wp-content/uploads/2015/09/1982-Exxon-Primer-on-CO2-Greenhouse-Effect.pdf.

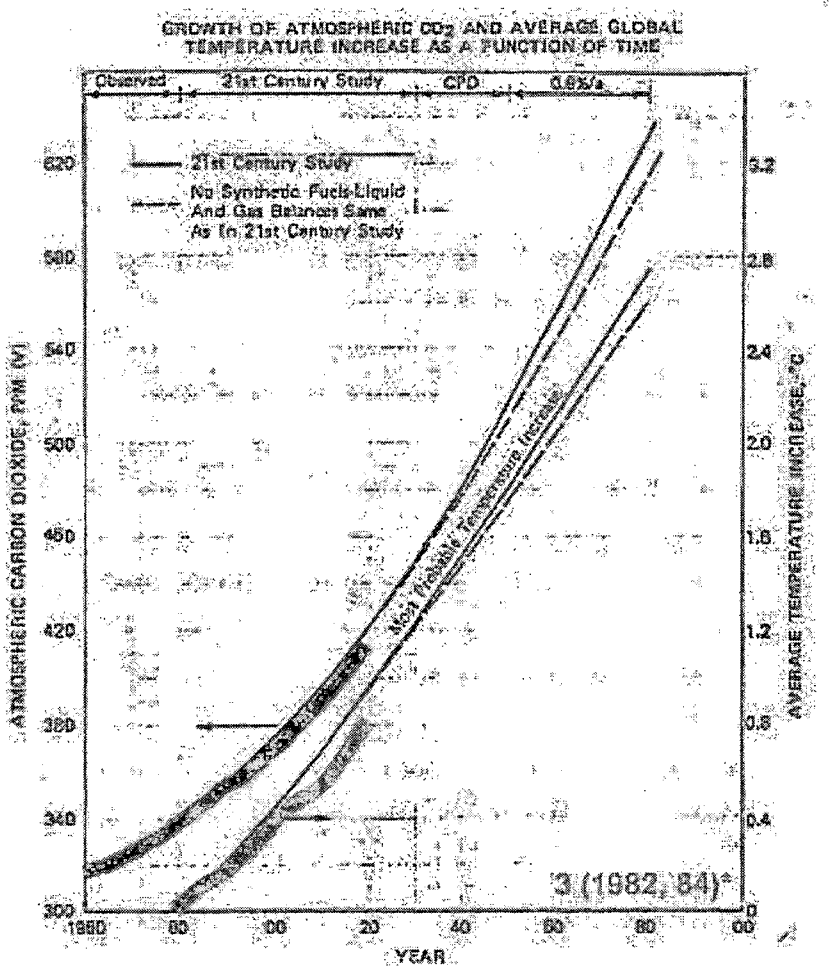

Figure 5: Exxon's Internal Prediction of Future CO_2 Increase and Global Warming from 1982[46]

Exxon's predictions were accurate. The blue line represents actual observed carbon levels and the red line shows actual observed temperature increases, closely tracking Exxon's predictions.

4.40. The primer warned of many climate impacts Exxon had acknowledged in other memos, including "climate related famine," and "potentially catastrophic effects" such as

[46] Id. The company predicted a doubling of atmospheric carbon dioxide concentrations above preindustrial levels by around 2070 (left curve), with a temperature increase of more than 2°C over the 1979 level (right curve). The same document indicated that Exxon estimated that by 1979 a global warming effect of approximately 0.25°C may already have occurred.

melting of the Antarctic ice sheet that would flood Washington, D.C. and the state of Florida. The primer also warned of feedback loops—events triggered by warming that could release massive amounts of greenhouse gasses, leading to even further warming.

4.41. The primer also estimated that undertaking "[s]ome adaptive measures" (not all of them) would cost "a few percent of the gross national product estimated in the middle of the next century" (i.e., $400 billion in 2018).[47] "Mitigation of the 'greenhouse effect' would require major reductions in fossil fuel combustion."[48]

4.42. In 1982, the Director of Exxon's Theoretical and Mathematical Sciences Laboratory, Roger Cohen, wrote Alvin Natkin of Exxon's Office of Science and Technology stating that "a clear scientific consensus has emerged . . . that a doubling of atmospheric CO2 would result in an average global temperature rise of (3.0 ± 1.5) °C. . . . There is unanimous agreement in the scientific community that a temperature increase of this magnitude would bring about significant changes in the earth's climate. . . The time required for doubling of atmospheric CO2 depends on future world consumption of fossil fuels."[49] Cohen noted that "the results of our [Exxon's] research are in accord with the scientific consensus on the effect of increased atmospheric CO2 on climate."

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[47] See Gross National Product, Fed. Reserve Bank of St. Louis (updated Mar. 26, 2020), https://fred.stlouisfed.org/series/GNPA.

[48] Memorandum from M.B. Glaser, CO_2 "Greenhouse" Effect, Exxon Research and Engineering Company (Nov. 12, 1982), https://insideclimatenews.org/sites/default/files/documents/1982%20Exxon%20Primer%20on%20CO2%20Greenhouse%20Effect.pdf.

[49] Memorandum from Roger W. Cohen, Exxon Research and Engineering Co., to A.M. Natkin, Exxon Corp. Office of Science and Technology, ClimateFiles (Sept. 2, 1982), http://www.climatefiles.com/exxonmobil/1982-exxon-memo-summarizing-climate-modeling-and-co2-greenhouse-effect-research.

4.43. In October 1982, at a symposium that API members, including Exxon, attended, the president of Columbia University's Geophysical Observatory delivered a speech wherein he stated: "[f]ew people doubt that the world has entered an energy transition away from dependence upon fossil fuels and toward some mix of renewable resources that will not pose problems of CO_2 accumulation."

4.44. In 1988, Shell issued a confidential internal report acknowledging that burning fossil fuels is a primary driver of global warming and would "create significant changes in sea level, ocean currents, precipitation patterns, regional temperature and weather." "[B]y the time the global warming becomes detectable it could be too late to take effective countermeasures to reduce the effects or even to stabilise the situation." The report emphasized that "the potential implications for the world are . . . so large that policy options [to reduce emissions] need to be considered much earlier." Thus, rather than research "what the world may be facing exactly," research should be directed to ways to reduce emissions and alternate energy options.[50]

4.45. Shell also acknowledged that: "it is possible that perception of a serious environmental threat [such as climate change] could swing opinion away from fossil fuel combustion and lead to a revival of interest in conservation, renewable sources and particularly nuclear energy."[51] In assessing the "[i]mplications for Shell Companies . . . Group Planning felt

[50] Shell Internationale Petroleum, Greenhouse Effect Working Group, The Greenhouse Effect (May 1988), https://www.documentcloud.org/documents/4411090-Document3.html#document/p9/a411239; https://s3.documentcloud.org/documents/4411090/Document3.pdf

[51] *Id.* at 19.

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there was a possibility that an increasing awareness of the greenhouse effect might change people's attitudes towards non-fossil energy sources, especially nuclear."[52]

4.46. In the mid-1990s, Shell began using scenarios to plan how the company could respond to various global forces in the future. In one scenario published in a 1998 internal report, Shell paints an eerily prescient scene:

> In 2010, a series of violent storms causes extensive damage to the eastern coast of the U.S. Although it is not clear whether the storms are caused by climate change, people are not willing to take further chances. The insurance industry refuses to accept liability, setting off a fierce debate over who is liable: the insurance industry or the government. After all, two successive IPCC reports since 1993 have reinforced the human connection to climate change . . . Following the storms, a coalition of environmental NGOs brings a class-action suit against the US government and fossil-fuel companies on the grounds of neglecting what scientists (including their own) have been saying for years: that something must be done. A social reaction to the use of fossil fuels grows, and individuals become 'vigilante environmentalists' in the same way, a generation earlier, they had become fiercely anti-tobacco. Direct-action campaigns against companies escalate. Young consumers, especially, demand action.[53]

4.47. Defendants considered their predictions of climate change to be so reliable, they based multi-million dollar investments on them. Defendants spent millions raising offshore drilling platforms to account for future global warming-induced sea level rise; reinforcing offshore oil platforms to withstand increased wave strength and storm severity; developing technology and infrastructure to extract, store, and transport fossil fuels in a warming arctic

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[52] *Id.* at p. 23

[53] Royal Dutch/Shell Group, Group Scenarios 1998–2020 115, 122 (1998), http://www.documentcloud.org/documents/4430277-27-1-Compiled.html.

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environment; and developing and patenting designs for equipment intended to extract crude oil and/or natural gas in areas previously unreachable because of the presence of polar ice sheets.[54]

4.48. As early as 1973, Exxon obtained a patent for a cargo ship capable of breaking through sea ice[55] and for an oil tanker[56] designed specifically for use in previously unreachable areas of the Arctic.

4.49. In 1974, Chevron, in like manner, obtained a patent for a mobile arctic drilling platform designed to withstand significant interference from lateral ice masses,[57] allowing for drilling in areas with increased ice flow movement due to elevated temperature.

4.50. That same year, Texaco (Chevron) worked toward obtaining a patent for a method and apparatus for reducing ice forces on a marine structure prone to being frozen in ice through natural weather conditions,[58] allowing for drilling in previously unreachable Arctic areas that would become seasonally accessible.

4.51. Shell obtained a patent similar to Texaco's (Chevron) in 1984.[59]

4.52. In 1989, Norske Shell, Royal Dutch Shell's Norwegian subsidiary, altered designs for an offshore drilling platform that was anticipated to operate until roughly 2065. The

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[54] Lieberman, Amy and Susanne Rust. Big Oil braced for global warming while it fought regulations. (Dec. 31, 2015) https://graphics.latimes.com/oil-operations/

[55] ExxonMobil Research Engineering Co., Patent US3727571A: Icebreaking cargo vessel (granted Apr. 17, 1973), https://www.google.com/patents/US3727571.

[56] ExxonMobil Research Engineering Co., Patent US3745960A: Tanker vessel (granted July 17, 1973), https://www.google.com/patents/US3745960.

[57] Chevron Research & Technology Co., Patent US3831385A: Arctic offshore platform (granted Aug. 27, 1974), https://www.google.com/patents/US3831385.

[58] Texaco Inc., Patent US3793840A: Mobile, arctic drilling and production platform (granted Feb. 26, 1974), https://www.google.com/patents/US3793840.

[59] Shell Oil Co., Patent US4427320A: Arctic offshore platform (granted Jan. 24, 1984), https://www.google.com/patents/US4427320.

platform was originally designed to stand approximately 100 feet above sea level—the amount necessary to stay above waves in a once-in-a-century strength storm. However, Shell engineers revised their plans to increase the above-water height of the platform by 3 to 6 feet, specifically to account for higher anticipated average sea levels and increased storm intensity due to global warming over the platform's operational life. Raising the platform cost Shell an additional forty million dollars.[60]

4.53. In the mid-1990s, ExxonMobil, Shell, and Imperial Oil (ExxonMobil) jointly undertook an offshore drilling project in Nova Scotia. According to the project's Environmental Impact Statement, the project estimated a "global warming sea-level rise" impact of 0.5 m [1.64 feet] during the 25-year life of the project. Exxon and Shell designed their coastal and offshore structures accordingly.[61]

4.54. Defendants did not engage in climate research to benefit, educate, or warn the public. Defendants engaged in this research to protect their business interests. Defendants recognized decades ago that carbon emissions from fossil fuels were concentrating in the atmosphere and that this would lead to massive warming and catastrophic climate disruption. Defendants also recognized that increasing public awareness of the problem threatened their market share and profits and could lead to the development of competing alternative energy source and reduced demand for fossil fuels. Accordingly, as described in this Part B and in Part

[60] *Id.*; Lieberman, Amy and Susanne Rust. Big Oil braced for global warming while it fought regulations. (Dec. 31, 2015) https://graphics.latimes.com/oil-operations/

[61] ExxonMobil, Sable Project Development Plan, vol. 3, 4-77, http://soep.com/about-the-project/development-plan-application.

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C below, Defendants did not warn consumers of the dangers of Defendants' products. Rather, they actively engaged in disinformation and concealed the risks they well understood.

C. Defendants chose to deceive the public, and risk catastrophic climate change, in order to continue profiting from fossil fuels.

4.55. Once the public began to learn of the risks from using fossil fuels—risks that Defendants already knew—Defendants chose to deceive the public about climate change and the impact of fossil fuels. Defendants did this in order to maintain and increase demand for fossil fuels, limit demand for competing energy options, and increase their profits.

4.56. Several events in the late 1980s and early 1990s led to greater public awareness of climate change:

a. In 1988, NASA scientist James Hansen testified to Congress that human activities were causing global warming.[62] The testimony was widely publicized, including coverage on the front page of The New York Times.

b. Also in 1988, the United Nations formed the Intergovernmental Panel on Climate Change ("IPCC"), a scientific panel charged with assessing available scientific information on climate change, its impacts, and potential response strategies.[63]

c. The IPCC issued its first report in 1990 and a supplement in 1992. The IPCC concluded that "emissions from human activities are substantially increasing the atmospheric concentrations of greenhouse gases." Burning fossil fuels was responsible for 70-

[62] See Peter C. Frumhoff et al., The Climate Responsibilities of Industrial Carbon Producers, 132 Climatic Change 161 (2015).

[63] Bruce, J. P. and A. T. Brough. Memorandum of Understanding Between the United Nations Environment Programme (UNEP) and the World Meteorological Association (WMO) on the Intergovernmental Panel on Climate Change (IPCC). (1989). https://www.ipcc.ch/site/assets/uploads/2019/06/MOU_between_UNEP_and_WMO_on_IPCC-1989.pdf

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90% of those emissions. The increase in greenhouse gasses will warm the Earth's surface, leading to serious environmental damage. The IPCC found sufficient evidence of these risks to justify immediate "use of cleaner, more efficient energy sources with lower or no emissions of greenhouse gases."[64]

4.57. In response, Defendants embarked on a campaign to discredit the science and deceive the public. Defendants' campaign focused on concealing, discrediting, and misrepresenting information that could reduce demand for fossil fuels or increase demand for alternative energy sources.

4.58. Defendants acted independently and jointly through API and other associations such as the International Petroleum Industry Environmental Conservation Association, the Information Council for the Environment, the Global Climate Coalition, and the Global Climate Science Communications Team.

4.59. Unearthed internal documents and admissions from former employees evince a deliberate strategy to mislead the public through direct misrepresentations to consumers through advertising and other publications and also through use of seemingly independent front groups and scientific spokespeople.

D. Defendants strategized to use seemingly independent technical sources in order to confuse and mislead consumers about the scientific evidence for climate change

4.60. In a secretly-recorded video from 2021, an Exxon executive admitted:

"Did we aggressively fight against some of the science? Yes.

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[64] IPCC, Climate Change: The IPCC Scientific Assessment xi (1990), https://www.ipcc.ch/report/climate-change-the-ipcc-1990-and-1992-assessments.

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"Did we join some of these shadow groups to work against some of the early efforts? Yes, that's true. There's nothing illegal about that.

"We were looking out for our investments. We were looking out for our shareholders."[65]

4.61. In 1988, Joseph Carlson, an Exxon public affairs manager, stated in an internal memo that Exxon "is providing leadership through API in developing the petroleum industry position" on climate change.[66] The "Exxon Position" would be in part to:

> EMPHASIZE THE UNCERTAINTY IN SCIENTIFIC CONCLUSIONS REGARDING THE POTENTIAL ENHANCED GREENHOUSE EFFECT.
>
> RESIST THE OVERSTATEMENT AND SENSATIONALIZATION OF POTENTIAL GREENHOUSE EFFECT WHICH COULD LEAD TO NONECONOMIC DEVELOPMENT OF NONFOSSIL FUEL RESOURCES.

4.62. In 2019, Professor Martin Hoffert, a physicist and Exxon consultant in the 1980s, testified to Congress about Exxon's "climate science denial program campaign," stating:

> [O]ur research [at Exxon] was consistent with findings of the United Nations Intergovernmental Panel on Climate Change on human impacts of fossil fuel burning, which is that they are increasingly having a perceptible influence on Earth's climate. . . . If anything, adverse climate change from elevated CO2 is proceeding faster than the average of the prior IPCC mild projections and fully consistent with what we knew back in the early 1980's at Exxon. . . . I was greatly distressed by the climate science denial program campaign that

[65] Brady, Jeff. Exxon Lobbyist Caught On Video Talking About Undermining Biden's Climate Push (July 1, 2021). https://www.npr.org/2021/07/01/1012138741/exxon-lobbyist-caught-on-video-talks-about-undermining-bidens-climate-push

[66] Memorandum from Joseph M. Carlson, The Greenhouse Effect (Aug. 3, 1988), https://assets.documentcloud.org/documents/3024180/1998-Exxon-Memo-on-the-Greenhouse-Effect.pdf.

> Exxon's front office launched around the time I stopped working as a consultant—but not collaborator—for Exxon. The advertisements that Exxon ran in major newspapers raising doubt about climate change were contradicted by the scientific work we had done and continue to do. Exxon was publicly promoting views that its own scientists knew were wrong, and we knew that because we were the major group working on this.[67]

4.63. Defendants' tactics – e.g., outright denial, claiming uncertainty when there was in fact a scientific consensus, and secretly funding, then publicly promoting fringe scientific theories as evidence of a true scientific debate – mirrored the tactics that cigarette companies used to persuade consumers that smoking did not cause cancer.

4.64. That Defendants employed tactics like those used by cigarette companies is no surprise – they hired many of the same consultants from the same public relations firms and, in some cases, used the very same front groups and scientists to act as spokespeople to mislead the public.

4.65. Defendants formed the International Petroleum Industry Environmental Conservation Association to coordinate the industry's response to the public's growing awareness of climate change. Within the Association, Defendants participated in a "Working Group on Global Climate Change." In 1990, the Working Group sent a strategy memo to Defendants and hundreds of other oil companies. The memo explained that, to forestall a global shift away from burning fossil fuels for energy, the industry should emphasize uncertainties in

[67] Examining the Oil Industry's Efforts to Suppress the Truth About Climate Change, Hearing Before the Subcomm. on Civil Rights and Civil Liberties of the Comm. on Oversight and Reform, 116th Cong. 7–8 (Oct. 23, 2019) (statement of Martin Hoffert, Former Exxon Consultant, Professor Emeritus, Physics, New York University), https://oversight.house.gov/hearing/subcommittee-on-civil-rights-climate-change/

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climate science, call for further research, and promote industry-friendly policies that would leave the fossil-fuel business intact.[68]

4.66. In 1991, the Information Council for the Environment, whose members included Defendants, launched a national climate change science denial campaign with full-page newspaper ads, radio commercials, a public relations tour schedule, "mailers," and research tools to measure campaign success. The campaign's top strategy was to:

> **1. Reposition global warming as theory (not fact).**

Its target audiences included younger, lower-income women who "are likely to be 'green' consumers, to believe the earth is warming, and to think the problem is serious . . . These women are good targets for magazine advertisements."[69]

4.67. The campaign planned to "use a spokesman from the scientific community" based on consumer research that found "technical and expert sources have the highest credibility among a broad range of members of the public."[70]

4.68. In 1994, an internal Shell report similarly described its public relations plan to emphasize that:

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[68] Benjamin A. Franta, Big Carbon's Strategic Response to Global Warming, 1950-2020 140 (2022), https://purl.stanford.edu/hq437ph9153.

[69] Union of Concerned Scientists, Deception Dossier #5: Coal's "Information Council on the Environment" Sham (1991), https://www.ucsusa.org/sites/default/files/attach/2015/07/The-Climate-Deception-Dossiers.pdf.

[70] *Id.*

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> Scientific uncertainty and the evolution of energy systems indicate that policies to curb greenhouse gas emissions beyond 'no regrets' measures could be premature, divert resources from more pressing needs and further distort markets. [71]

4.69. In 1998, API formed the Global Climate Science Communications Team, including representatives from Exxon, API, and Chevron. There were no scientists on the Science Communications Team. The Science Communications Team enlisted several Defendant-funded front groups to participate, as well as a front group created by cigarette-maker Phillip Morris, "The Advancement of Sound Science Coalition," and its executive director, Steve Milloy, to assist. Philip Morris had created and funded "The Advancement of Sound Science Coalition" to act as a seemingly more credible and independent voice to claim that second-hand smoke did not cause cancer or heart disease. API and Defendants paid The Advancement of Sound Science Coalition and Steve Milloy, to spread doubt about climate science in the same way that it spread doubt about smoking and cancer.[72]

4.70. The Global Climate Science Communications Team "developed an action plan to inform the American public that science does not support the precipitous actions Kyoto would dictate [i.e., reducing use of fossil fuels]." According to the plan:

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[71] Shell Internationale Petroleum, Greenhouse Effect Working Group, The Greenhouse Effect (May 1988), https://www.documentcloud.org/documents/4411090-Document3.html#document/p9/a411239.

[72] Union of Concerned Scientists, Smoke, Mirrors & Hot Air: How ExxonMobil Uses Big Tobacco's Tactics to Manufacture Uncertainty on Climate Science (July 16, 2007), https://www.ucsusa.org/resources/smoke-mirrors-hot-air.

Victory Will Be Achieved When

- **Average citizens "understand" (recognize) uncertainties in climate science; recognition of uncertainties becomes part of the "conventional wisdom"**
- **Media "understands" (recognizes) uncertainties in climate science.**
- **Media coverage reflects balance on climate science and recognition of the validity of viewpoints that challenge the current "conventional wisdom"**
- **Industry senior leadership understands uncertainties in climate science, making them stronger ambassadors to those who shape climate policy**
- **Those promoting the Kyoto treaty on the basis of extant science appear to be out of touch with reality.**

4.71. The Global Climate Science Communications Team would: "1. Develop and implement a national media relations program to inform the media about uncertainties in climate science to generate national, regional, and local media coverage on the scientific uncertainties," to be accomplished by the following (among other actions): "offer scientists to appear on radio talk shows across the country . . . Identify, recruit, and train a team of five independent scientists to participate in media outreach . . . Produce [and] distribute a steady stream" of climate science information and editorials "authored by scientists" to media outlets nationwide. The Science Communications Team would also "Organize, promote and conduct through grassroots organizations a series of campus/community workshops/debates on climate science."[73]

4.72. The Communications Team also planned to create a "one-stop resource on climate science" for industry partners, as well as policymakers, the media, and "all others concerned." In particular, the resource center would provide the "logistical and moral support"

[73] Email from Joe Walker to Global Climate Science Team, Draft Global Climate Science Communications Plan (Apr. 3, 1998), https://assets.documentcloud.org/documents/784572/api-global-climate-science-communications-plan.pdf.

to enable industry partners to advocate for protecting fossil fuel markets based on alleged uncertainties in climate science.[74]

4.73. Soon after, API distributed a memo to its members stating: "Climate is at the center of industry's business interests. Policies limiting carbon emissions reduce petroleum product use. That is why it is API's highest priority issue and defined as strategic."[75]

4.74. On information and belief, Defendants and API engaged in deceiving the public about climate change intended to do so not just to influence policy, but also to ensure continued consumer demand for fossil fuels and avoid competition from cleaner energy sources.

[74] Email from Joe Walker to Global Climate Science Team, Draft Global Climate Science Communications Plan (Apr. 3, 1998), https://assets.documentcloud.org/documents/784572/api-global-climate-science-communications-plan.pdf.

[75] Allegations of Political Interference with Government Climate Change Science, Hearing Before the Comm. on Oversight and Government Reform, 110th Cong. 324 (Mar. 19, 2007) https://www.govinfo.gov/content/pkg/CHRG-110hhrg37415/html/CHRG-110hhrg37415.htm

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E. Defendants spread their deceptive messages to consumers in part through advertisements and other publications.

4.75. Below are some of the Information Council for the Environment's advertisements:[76]

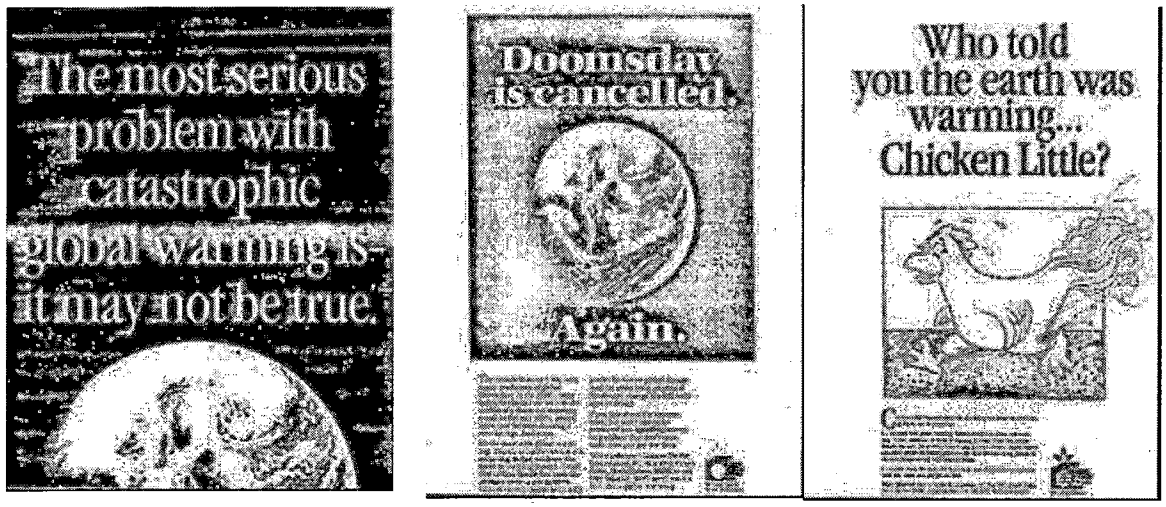

Figure 6: Information Council for the Environment Advertisements

4.76. For over a decade, Mobil (ExxonMobil) regularly published advertisements in the New York Times and other national newspapers. These advertisements were meant to look like editorials, not paid advertisements. In line with Defendants' strategy, many such "advertorials" claimed the science of climate change was uncertain or lacking evidence.

4.77. Mobil ran the following advertorial in the New York Times in 1993:

[76] Union of Concerned Scientists, Deception Dossier #5: Coal's "Information Council on the Environment" Sham at 47-49 (1991), http://www.ucsusa.org/sites/default/files/attach/2015/07/Climate-Deception-Dossier-5_ICE.pdf.

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Apocalypse no

For the first half of 1992, America was inundated by the media with dire predictions of global warming catastrophes, all of which seemed to be aimed at heating up the rhetoric from the Earth Summit in Rio de Janeiro last June.

Unfortunately, the media hype proclaiming that the sky was falling did not properly portray the consensus of the scientific community. After the Earth Summit, there was a noticeable lack of evidence of the sky actually falling and subsequent colder than normal temperatures across the country cooled the warming hysteria as well.

Everybody, of course, remembers the Earth Summit and the tons of paper used up in reporting on it—paper now buried in landfills around the world. But few people ever heard of a major document issued at the same time and called the "Heidelberg Appeal." The reason? It just didn't make "news."

Perhaps that is because the Appeal urged Summit attendees to avoid making important environmental decisions based on "pseudo-scientific arguments or false and non-relevant data."

The Heidelberg Appeal was issued initially by some 284 scientists from around the world, including 52 Nobel Prize winners. Today, the Appeal carries the signatures of more than 2,300 scientists—55 of them Nobel Prize winners—from 79 countries. If nothing else, its message is illustrative of what's wrong with so much of the global warming rhetoric. The lack of solid scientific data.

Scientists can agree on certain facts pertaining to global warming. First, the greenhouse effect is a natural phenomenon; it accounts for the moderate temperature that makes our planet habitable. Second, the concentration of greenhouse gases (mainly carbon dioxide) has increased and there has been a slight increase in global temperatures over the past century. Finally, if present trends continue, carbon dioxide levels will double over the next 50 to 100 years.

Controversy arises when trying to link past changes in temperatures to increased concentrations of greenhouse gases. And it arises again when climate prediction models are used to conclude Earth's temperature will climb drastically in the next century and—based on such models—to propose policy decisions that could drastically affect the economy.

According to Arizona State University climatologist Dr. Robert C. Balling in his book, *The Heated Debate* (San Francisco: Pacific Research Institute for Public Policy, 1992), until knowledge of the interplay between oceans and the atmosphere improves, "model predictions must be treated with considerable caution." Moreover, models don't simulate the complexity of clouds, nor do they deal adequately with sea ice, snow or changes in intensity of the sun's energy.

And they don't stand up to reality testing. Comparing actual temperatures over the last 100 years against model calculations, the models predicted temperature increases higher than those that actually occurred. Moreover, most of the earth's temperature increase over the last century occurred before 1940. Yet, the real build-up in man-made CO_2 didn't occur until after 1940. Temperatures actually fell between 1940 and 1970.

Sifting through such data, Dr. Balling has concluded, "there is a large amount of empirical evidence suggesting that the apocalyptic vision is in error and that the highly touted greenhouse disaster is most improbable."

Other scientists have an even more interesting viewpoint. Notes atmospheric physicist S. Fred Singer, president of the Washington, D.C.-based Science & Environmental Policy Project, "the net impact [of a modest warming] may well be beneficial."

All of which would seem to suggest that the jury's still out on whether drastic steps to curb CO_2 emissions are needed. It would seem that the phenomenon—and its impact on the economy—are important enough to warrant considerably more research before proposing actions we may later regret.

Perhaps the sky isn't falling, after all.

Mobil

4.78. The advertorial quotes Fred Singer, a physicist whom tobacco companies funded to promote his claim that second-hand smoke did not cause cancer.[77]

4.79. On information and belief, Defendants financially supported Fred Singer and his writings, though the advertisement presents Singer as a neutral expert.

4.80. The advertisement also presents Robert C. Balling as another neutral scientific expert. Yet five years after Mobil ran this advertorial, Balling acknowledged that he had received $408,000 in funding from the fossil fuel industry, including from ExxonMobil.[78]

4.81. The advertorial misleadingly portrays the "Heidelberg Appeal" as evidence that there was insufficient scientific data for action on climate change. In fact, the Heidelberg Appeal did not discuss climate change or the validity of scientific reasoning or evidence showing that climate change is happening, is human-caused, and will cause severe environmental damage.[79]

4.82. Many other Exxon and Mobil advertorials falsely or misleadingly characterized the state of climate science research. Below are examples of statements appearing in Exon and Mobil advertisements:

a. "We don't know enough about the factors that affect global warming and the degree to which—if any—that man-made emissions (namely, carbon dioxide) contribute to increases in Earth's temperature."[80]

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[77] Schwartz, John. S. Fred Singer, a Leading Climate Change Contrarian, Dies at 95. Derided as a "Merchant of Doubt," he spent decades trying to refute the evidence of global warming and other environmental risks. (April 11, 2020). https://www.nytimes.com/2020/04/11/climate/s-fred-singer-dead.html.

[78] Robert C. Balling Jr. DeSmog. https://www.desmog.com/robert-c-balling-jr/.

[79] Heidelberg Appeal. DeSmog. https://www.desmog.com/heidelberg-appeal/.

[80] Mobil, Climate Change: A Prudent Approach, in N.Y. Times (Nov. 13, 1997), https://www.documentcloud.org/documents/705548-mob-nyt-1997-11-13-climateprudentapproach.html.

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b. "[G]reenhouse-gas emissions, which have a warming effect, are offset by another combustion product—particulates—which leads to cooling."[81]

c. "Even after two decades of progress, climatologists are still uncertain how—or even if—the buildup of man-made greenhouse gases is linked to global warming. It could be at least a decade before climate models will be able to link greenhouse warming unambiguously to human actions. Important answers on the science lie ahead."[82]

d. "[I]t is impossible for scientists to attribute the recent small surface temperature increases to human causes."[83]

4.83. A quantitative analysis of ExxonMobil's climate communications between 1989 and 2004 found that, while 83% of the company's peer-reviewed papers and 80% of its internal documents acknowledged the reality and human origins of climate change, 81% of its advertorials communicated doubt about those conclusions.[84]

4.84. In 1996, Exxon published a pamphlet, "Global Warming: Who's Right? Facts about a debate that's turned up more questions than answers." False or misleading statements in the pamphlet include the following: In the preface, Exxon's CEO stated that "many scientists

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[81] Mobil, Less Heat, More Light on Climate Change (July 18, 1996), https://www.documentcloud.org/documents/705544-mob-nyt-1996-jul-18-lessheatmorelight.html.

[82] Mobil, Climate Change: Where We Come Out, in N.Y. Times (Nov. 20, 1997), https://www.documentcloud.org/documents/705549-mob-nyt-1997-11-20-ccwherewecomeout.html.

[83] ExxonMobil, Unsettled Science (Mar. 23, 2000), reproduced in https://www.theguardian.com/environment/2021/nov/18/the-forgotten-oil-ads-that-told-us-climate-change-was-nothing.

[84] Geoffrey Supran & Naomi Oreskes, Assessing ExxonMobil's Climate Change Communications (1977–2014), 12 Envtl. Research Letters, IOP Publishing Ltd. 12 (2017), https://iopscience.iop.org/article/10.1088/1748-9326/aa815f/pdf.

agree there's ample time to better understand the climate system." The pamphlet misleadingly described the greenhouse effect, calling it "definitely a good thing" and "what makes the earth's atmosphere liveable" without mentioning the severe damage that the greenhouse effect could cause if carbon levels continued to rise. Contradicting Exxon's internal and peer-reviewed scientific research, the pamphlet ascribed the rise in temperature since the late nineteenth century to "natural fluctuations that occur over long periods of time" rather than to burning fossil fuels. The publication also falsely claimed that models projecting future impacts to the climate from rising carbon levels, including those developed by Exxon employees, as having been "proved to be inaccurate." Further, the pamphlet claimed "the indications are that a warmer world would be far more benign than many imagine . . . moderate warming would reduce mortality rates in the US, so a slightly warmer climate would be more healthful." Exxon further claimed that advocates for reducing fossil fuel use were simply "drawing on bad science, faulty logic, or unrealistic assumptions," without disclosing that Exxon's own research supported those advocates' claims.[85]

4.85. Also in 1996, API published the book *Reinventing Energy: Making the Right Choices* claiming "there is no persuasive basis for forcing Americans to dramatically change their lifestyles to use less oil." "[N]o scientific evidence exists that human activities are significantly affecting sea levels, rainfall, surface temperatures or the intensity and frequency of

[85] Exxon Corp., Global Warming: Who's Right? (1996). https://www.climatefiles.com/exxonmobil/global-warming-who-is-right-1996/

storms." "Facts don't support the arguments for restraining oil use."[86],[87] API claimed that scientists do not understand how carbon flows in and out of the atmosphere or whether fossil fuels are responsible for increasing concentrations of atmospheric CO_2. It then explained that even if some warming does occur, such warming "would present few if any problems." For example, farmers could be "smart enough to change their crop plans" and low-lying areas would "likely adapt" to sea-level rise.[88]

4.86. Defendants shared these talking points with other members of the fossil fuel industry. In a 1997 speech to the World Petroleum Congress, Exxon's CEO claimed:

> We also have to keep in mind that most of the greenhouse effect comes from natural sources . . . Leaping to radically cut this tiny sliver of the greenhouse pie on the premise that it will affect climate defies common sense and lacks foundation in our current understanding of the climate system.
>
> Let's agree there's a lot we really don't know about how climate will change in the 21st century and beyond . . . It is highly unlikely that the temperature in the middle of the next century will be significantly affected whether policies are enacted now or 20 years from now.[89]

4.87. In a 1998 publication from Imperial Oil (ExxonMobil), "A Cleaner Canada," Imperial's CEO publicly claimed:

> There is absolutely no agreement among climatologists on whether or not the planet is getting warmer, or, if it is, on whether the warming is

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[86] Sally Brain Gentille et al., Reinventing Energy: Making the Right Choices, American Petroleum Institute (1996), http://www.climatefiles.com/trade-group/american-petroleum-institute/1996-reinventing-energy.

[87] American Petroleum Institute, Reinventing Energy: Making the Right Choices 79 (1996), http://www.climatefiles.com/trade-group/american-petroleum-institute/1996-reinventing-energy.

[88] Id. at 86–87.

[89] Lee R. Raymond, Chairman and Chief Executive Officer, Exxon Corp., Address at the World Petroleum Congress (Oct. 13, 1997), https://www.climatefiles.com/exxonmobil/1997-exxon-lee-raymond-speech-at-world-petroleum-congress/.

> the result of man-made factors or natural variations in the climate. . . . I feel very safe in saying that the view that burning fossil fuels will result in global climate change remains an unproved hypothesis.[90]

F. Defendants funded and promoted seemingly independent scientists and groups to deceive the public about climate change.

4.88. Defendants also participated in the Global Climate Coalition ("GCC"), an industry group formed in 1989 to advertise and distribute material to encourage continued consumption of fossil fuels.[91] The Coalition's position on climate change was that "the preponderance of the evidence indicates that most, if not all, of the observed warming is part of [a] natural warming trend which began approximately 400 years ago. If there is [a human-caused] component to this observed warming, the GCC believes that it must be very small and must be superimposed on a much larger natural warming trend."[92]

4.89. Despite what the Global Climate Coalition said publicly, it acknowledged internally that the alternative theories were unfounded. A draft version of the Coalition's "primer" on climate science acknowledged that various "contrarian theories" (i.e., climate change skepticism) do not "offer convincing arguments against the conventional model of greenhouse gas emission-induced climate change," but this section was deleted from the public

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[90] Robert Peterson, A Cleaner Canada in Imperial Oil Review (1998), https://www.climatefiles.com/exxonmobil/imperial-oil/1998-imperial-oil-article-a-cleaner-canada-by-robert-peterson/.

[91] Id.

[92] Global Climate Coalition, Global Climate Coalition: An Overview 2 (Nov. 1996), http://www.climatefiles.com/denial-groups/global-climatecoalition-collection/1996-global-climate-coalition-overview/.

version.[93] Instead, Defendants and the Coalition funded and promoted some of those same contrarian theories.

4.90. Between 1989 and 1998, the Global Climate Coalition spent $13 million on advertisements as part of a campaign to deceive the public about the scientific support for climate change.[94]

4.91. In a 1994 report, the Global Climate Coalition falsely stated that "observations have not yet confirmed evidence of global warming that can be attributed to human activities," that "[t]he claim that serious impacts from climate change have occurred or will occur in the future simply has not been proven," so "there is no basis for the design of effective policy action that would eliminate the potential for climate change."[95]

4.92. In 1995, the Global Climate Coalition published a booklet called "Climate Change: Your Passport to the Facts," which falsely stated, "[w]hile many warnings have reached the popular press about the consequences of a potential man-made warming of the Earth's

[93] Memorandum from Gregory J. Dana, Assoc. of Int'l Auto. Mfrs., to AIAM Technical Committee, Global Climate Coalition (GCC) - Primer on Climate Change Science - Final Draft (Jan. 18, 1996), https://www.ucsusa.org/sites/default/files/attach/2015/07/Climate-Deception-Dossier-7_GCC-Climate-Primer.pdf.

[94] Wendy E. Franz, Kennedy School of Government, Harvard University, Science, Skeptics and Non-State Actors in the Greenhouse, ENRP Discussion Paper E-98-18 13 (Sept. 1998), https://www.belfercenter.org/sites/default/files/legacy/files/Science%20Skeptics%20and%20Non-State%20Actors%20in%20the%20Greenhouse%20-%20E-98-18.pdf.

[95] GCC, Issues and Options: Potential Global Climate Change, Climate Files (1994), http://www.climatefiles.com/denial-groups/global-climate-coalition-collection/1994-potential-global-climate-change-issues.

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atmosphere during the next 100 years, there remains no scientific evidence that such a dangerous warming will actually occur."[96]

4.93. In 1997, William O'Keefe, chairman of the Global Climate Coalition and executive vice president of API, wrote in a Washington Post op-ed, "[c]limate scientists don't say that burning oil, gas, and coal is steadily warming the earth."[97]

4.94. The Global Climate Coalition also sought to undermine credible climate science. When the IPCC concluded that burning fossil fuels was likely influencing the climate, the Global Climate Coalition responded by falsely and misleadingly claiming that the IPCC's report was the product of "scientific cleansing" that "understate[d] uncertainties about climate change causes and effect . . . to increase the apparent scientific support for attribution of changes to climate to human activities."[98] The Coalition promoted this claim to reporters, editors of scientific journals, and the readership of national newspapers.[99] The Coalition's effort "was

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[96] GCC, Climate Change: Your Passport to the Facts, Climate Files (1995), http://www.climatefiles.com/denial-groups/global-climate-coalition-collection/1995-climate-change-facts-passport.

[97] William O'Keefe, A Climate Policy, in The Washington Post (July 5, 1997), https://www.washingtonpost.com/archive/opinions/1997/07/05/a-climate-policy/6a11899a-c020-4d59-a185-b0e7eebf19cc/.

[98] Franz, Science, Skeptics and Non-State Actors in the Greenhouse at 14. https://www.belfercenter.org/sites/default/files/legacy/files/Science%20Skeptics%20and%20Non-State%20Actors%20in%20the%20Greenhouse%20-%20E-98-18.pdf.

[99] Naomi Oreskes & Erik Conway, Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming, New York: Bloomsbury Press 205–13 (2011). See also S. Fred Singer, Climate Change and Consensus, Science vol. 271, no. 5249 (Feb. 2, 1996); Frederick Seitz, A Major Deception on 'Global Warming', Wall Street Journal (June 12, 1996).

widely perceived to be an attempt on the part of the [Global Climate Coalition] to undermine the credibility of the IPCC."[100]

4.95. In 1998, a multi-state lawsuit against four of the largest tobacco companies for deceiving the public about whether smoking caused cancer settled for 365.5 billion dollars.[101] Defendants took note. As one Shell employee explained, the company "didn't want to fall into the same trap as the tobacco companies who have become trapped in all their lies."[102]

4.96. In response, Defendants shifted their communications strategy from outright denial of climate science to delay.[103] Defendants increasingly claimed that even if the climate "risk" was real, lingering uncertainties in the science did not justify the alleged exorbitant costs of reducing fossil fuel consumption.

4.97. Defendants also relied more on front groups and seemingly independent scientists to promote their deceptive messages.

4.98. BP and Shell publicly left the Global Climate Coalition, but remained members of API, who continued to participate in the Global Climate Coalition on behalf of BP, Shell, and API's other members.

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[100]Franz, Science, Skeptics, and Non-State Actors in the Greenhouse at 15. https://www.belfercenter.org/sites/default/files/legacy/files/Science%20Skeptics%20and%20Non-State%20Actors%20in%20the%20Greenhouse%20-%20E-98-18.pdf

[101] https://www.naag.org/our-work/naag-center-for-tobacco-and-public-health/the-master-settlement-agreement/.

[102] Nathaniel Rich, Losing Earth: A Recent History, London: Picador 186 (2020).

[103]Franta, Big Carbon's Strategic Response to Global Warming, 1950-2020 at 170. https://stacks.stanford.edu/file/druid:hq437ph9153/Franta%20-%20Big%20Carbon%20strategic%20response%20to%20global%20warming%201950-2020%20-%202022-08-25-augmented.pdf.

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4.99. Defendants have funded dozens of think tanks, front groups, and foundations to promote doubt on whether fossil fuels caused climate change, or whether climate change was a serious problem. In many cases, the funds were earmarked for climate change programs and constituted a substantial share of the group's budget. These include the Competitive Enterprise Institute, the Heartland Institute, Frontiers for Freedom, and the Committee for a Constructive Tomorrow. Many of these organizations have an overlapping—sometimes identical—collection of spokespeople serving as staff, board members, and scientific advisors. Funding multiple organizations with overlapping staff and spokespeople to spread the same message created a deceptive impression that a broad platform of experts and grassroots organizations supported Defendants' views.[104]

4.100. From 1998 to 2014, ExxonMobil spent almost $31 million funding numerous organizations misrepresenting the scientific consensus that fossil fuels were causing climate change with severe consequences for the public.[105]

4.101. In 2007, Exxon publicly reported: "In 2008, we will discontinue contributions to several public policy research groups whose position on climate change could divert attention from the important discussion on how the world will secure the energy required for economic

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[104] Smoke, Mirrors & Hot Air, How ExxonMobil Uses Big Tobacco's Tactics to Manufacture Uncertainty on Climate Science., Union of Concerned Scientists, January, 2007. exxon_report.pdf (ucsusa.org).

[105] https://www.greenpeace.org/usa/fighting-climate-chaos/exxon-and-the-oil-industry-knew-about-climate-crisis/exxons-climate-denial-history-a-timeline/#:~:text=Analysis%20of%20ExxonMobil%20Worldwide%20Contributions,and%20Union%20of%20Concerned%20Scientists.

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growth in an environmentally responsible manner."[106] While Exxon acknowledged that funding climate denial was affecting the public debate on climate change, Exxon did not keep its promise to stop. Exxon continued to support groups denying climate science in 2008 and beyond.

4.102. Several Defendants have been linked to other groups that undermine the scientific basis linking fossil fuels to climate change and sea-level rise, including the Frontiers of Freedom Institute and the George C. Marshall Institute.

4.103. Phillip Cooney, an attorney at API from 1996 to 2001, testified at a 2007 Congressional hearing that it was "typical" for API to fund think tanks and advocacy groups that minimized fossil fuels' role in climate change. Among the groups to which API provided funding were the Heartland Institute, Competitive Enterprise Institute, and the American Council on Capital Formation, each of which issued publications challenging the scientific consensus that fossil fuels were causing climate change and opposing restrictions on Defendants' extraction, production, and sale of fossil fuels.[107]

4.104. Defendants also paid scientists to research alternative causes of climate change and promote fringe theories that lacked substantial evidence or support. Those scientists obtained all or part of their research budget from Defendants directly or through Defendant-funded

[106] ExxonMobil, 2007 Corporate Citizenship Report 41 (Dec. 31, 2007), http://www.documentcloud.org/documents/2799777-ExxonMobil-2007-Corporate-Citizenship-Report.html.

[107] Id.

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organizations like API.[108] They frequently failed to disclose their fossil fuel industry underwriters, at times violating the ethical protocols of journals they published in.[109]

4.105. Defendant-funded front groups and API then promoted the research from the scientists Defendants had secretly funded, leading consumers to believe that the scientists were neutral experts unconnected to Defendants and that a wide variety of organizations accepted their views.

4.106. For example, in 2003, scientists Wei-Hock Soon and Sallie Baliunas published a paper claiming the twentieth century was not the warmest century of the past 1,000 years and that the climate had not changed significantly over that period. The paper acknowledged that API funds supported their research.

4.107. Soon received substantial funding from Exxon and API throughout his career. Soon also had contractually agreed to allow his donors to review his research before publication which he at times referred to as "deliverables." His housing institution also agreed not to disclose the arrangement without prior permission from his fossil fuel donors. [110]

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[108] E.g., Willie Soon & Sallie Baliunas, Proxy Climatic and Environmental Changes of the Past 1000 Years, 23 Climate Rsch. 88, 105 (Jan. 31, 2003), http://www.int-res.com/articles/cr2003/23/c023p089.pdf.

[109] E.g., Smithsonian Statement: Dr. Wei-Hock (Willie) Soon, Smithsonian (Feb. 26, 2015), https://web.archive.org/web/20181105223030/https://www.si.edu/newsdesk/releases/smithsonian-statement-dr-wei-hock-willie-soon.

[110] Union of Concerned Scientists, Climate Deception Dossier #1: Dr. Wei-Hock Soon's Smithsonian Contracts, (July 2015), https://www.ucsusa.org/sites/default/files/attach/2015/07/The-Climate-Deception-Dossiers.pdf [https://perma.cc/JL2V-XYGL] & https://s3.amazonaws.com/ucs-documents/global-warming/Climate-Deception-Dossier-1_Willie-Soon.pdf; https://www.ucsusa.org/resources/climate-deception-dossiers.

4.108. Baliunas and Soon were formally affiliated with numerous front groups that Defendants funded, including the Global Climate Coalition, the George Marshall Institute, the Competitive Enterprise Institute, the Heartland Institute, Tech Central Station, the Center for Science and Public Policy, an affiliate of Frontiers of Freedom, and the Committee for a Constructive Tomorrow.[111]

4.109. After Soon and Baliunas published their 2003 paper, Defendant-funded front groups quickly promoted their work as neutral expert opinion on the uncertainty of climate science. One such promotion was published in the Seattle Post-Intelligencer by William O'Keefe. Significantly, William O'Keefe's employment rotated between API, the Global Climate Coalition, the Marshall Institute, and the Competitive Enterprise Institute---all groups that Defendants helped to form and/or fund. O'Keefe has also been a registered lobbyist for Exxon and API.[112]

4.110. Following Soon and Baliunas' 2003 publication, three editors of the scientific journal wherein it was published resigned, criticizing the journal's review process as insufficiently rigorous and claiming Soon and Baliunas' cited evidence did not support their conclusions. Thirteen of the scientists cited in Soon and Baliunas' paper published a rebuttal

[111] Sallie Baliunas. DeSmog. https://www.desmog.com/sallie-baliunas/#s26 _; Willie Soon. DeSmog. https://www.desmog.com/willie-soon/.

[112] Union of Concerned Scientists, Climate Deception Dossier #1: Dr. Wei-Hock Soon's Smithsonian Contracts, (July 2015), https://www.ucsusa.org/sites/default/files/attach/2015/07/The-Climate-Deception-Dossiers.pdf [https://perma.cc/JL2V-XYGL] & https://s3.amazonaws.com/ucs-documents/global-warming/Climate-Deception-Dossier-1_Willie-Soon.pdf; O'Keefe, W., 2003, Global warming an uncertainty, Seattle Post-Intelligencer, December 12;
William O'Keefe. DeSmog. https://www.desmog.com/william-o-keefe/.

explaining that Soon and Baliunas had seriously misinterpreted their research.[113] William O'Keefe and the other Defendant-funded front groups publicly promoting Soon and Balinuas' 2003 paper did not disclose this controversy, their financial support for Soon and Baliunas' work, or their own connections to Defendants.

4.111. In addition to misleading the public about climate change, Defendants did not warn consumers of the known risks of using fossil fuels and the potential for catastrophic damage to public health, natural resources, and economies. Defendants also concealed their strategic collaborations with other companies and their support for seemingly independent third parties, further misleading the public.

4.112. Much of Defendants' deceptive activity and sophisticated understanding of climate change was not publicly discovered until journalists uncovered confidential industry documents and interviewed former employees beginning in 2015.[114]

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[113] Union of Concerned Scientists. Smoke, Mirrors & Hot Air: How ExxonMobil Uses Big Tobacco's Tactics to Manufacture Uncertainty on Climate Science. (Jan. 2007), https://www.ucsusa.org/sites/default/files/2019-09/exxon_report.pdfnn. 82-83.

[114] Neela Banerjee et al., Exxon: The Road Not Taken, InsideClimate News (Sept. 16, 2015), https://insideclimatenews.org/content/Exxon-The-Road-Not-Taken; the Los Angeles Times published a series of three articles between October and December 2015: see Katie Jennings et al., How Exxon went from leader to skeptic on climate change research, L.A. Times (Oct. 23, 2015), https://graphics.latimes.com/exxon-research; Sara Jerving et al., What Exxon knew about the Earth's melting Arctic, L.A. Times (Oct. 9, 2015), https://graphics.latimes.com/exxon-arctic/; Amy Lieberman & Susanne Rust, Big Oil braced for global warming while it fought regulations, L.A. Times (Dec. 31, 2015), https://graphics.latimes.com/oil-operations; Caroll Muffett & Steven Feit, Smoke and Fumes: The Legal and Evidentiary Basis for Holding Big Oil Accountable for the Climate Crisis, Ctr. for Int'l Envtl. Law 10 (2017), https://www.ciel.org/reports/smoke-and-fumes.

G. Defendants continue to deceive the public by failing to disclose the impact of fossil fuels on climate change, claiming their products reduce greenhouse gas emissions, promoting unproven technologies, and greenwashing.

4.113. While Defendants' deceptive campaign began as a campaign to deny or manufacture doubt about the role of fossil fuels in changing the climate, Defendants have adjusted their messages over time. The one constant, however, is that Defendants continue to mislead about relevant facts in order to foster continued demand for fossil fuels and dampen demand for clean energy alternatives.

4.114. Defendants:

a. Still do not disclose the impact of fossil fuels on climate change;

b. Promote fossil fuel products as "green," "sustainable," "carbon-neutral," and "lowering emissions;"

c. Promote unrealistic or unproven technologies that would permit continued reliance on fossil fuels and fossil-fuel-based cars, heating, and electricity; and

d. Promote themselves as clean energy companies who are actively working to achieve net-zero emissions.

4.115. Defendants' advertising is pervasive. Defendants reach the public through television, news, podcasts, online ads, Google searches, social media posts, YouTube videos, and through messaging from seemingly independent third parties (that are, in reality, closely connected to Defendants). Further, Defendants employ messaging strategies that amplify and maximize their influence on consumers and the public.

4.116. All of this serves a common end: giving consumers the impression that climate change is not a serious concern and, in any event, that Defendants are clean energy companies

who will solve climate change with "advanced" fossil fuels, new technologies, and reducing emissions.

4.117. Defendants' investments and business plans tell a different story. Defendants continue to explore for and produce increasing quantities of fossil fuels, to ensure dependence and to dampen demand for alternative energy sources and technologies. Reducing emissions is simply not in the business plan.[115]

4.118. Defendants' investments in clean energy are miniscule parts of their budgets and short-lived. Further, Defendants' commitment to this research is generally insufficient to achieve a transition away from fossil fuel dependence that Defendants claim in their ads to pursue.

H. Defendants fail to disclose the climate impacts of their fossil fuel products.

4.119. Defendants have spent fortunes deceiving the public about climate change and the harms and costs it imposes on public health, the economy, and natural resources, so as to protect their "core business" operations: selling more and more fossil fuels. That deception continues to this day.

[115] For example, ConocoPhillips' 2012 10-K SEC filing reveals the company's sole focus on producing fossil fuels for global distribution: "As an independent E&P company, we are solely focused on our core business of exploring for, developing and producing crude oil and natural gas globally." The filing further highlighted the company's "growing North American shale and oil sands businesses . . . and a global exploration program." ConocoPhillips, Annual Report (Form10-K) 32 (Dec. 31, 2012), https://www.sec.gov/Archives/edgar/data/1163165/000119312513065426/d452384d10k.htm. Indeed, in 2019, ConocoPhillips produced over 700,000 of barrels of crude oil per day and over 2.8 million cubic feet of natural gas per day. ConocoPhillips, 2019 Annual Report 168 (2019), https://static.conocophillips.com/files/resources/2019-conocophillips-annual-report-19-0895.pdf.

4.120. This disinformation affects consumer choices about all manner of decisions, including for example transportation, heating and cooling, building construction, appliances, travel, and recreation.

4.121. History shows that when people are made aware of the harmful effects or qualities of products they purchase, they often choose not to purchase them or to reduce their purchases. Awareness of such effects can also spur new markets for more environmentally friendly products.

4.122. For example, increased consumer awareness of the role of pesticides in harming human health, worker health, and the environment spurred a burgeoning market for food grown organically—with access to information about how their food was grown, consumers demanded healthier choices, and the market responded.

4.123. Consumers also responded swiftly to findings that the use of products like hairsprays and deodorants with chlorofluorocarbon ("CFC") containing aerosols were depleting the earth's protective ozone layer by purchasing substitutes for CFC-containing products.

4.124. As a BP executive stated in an internal memo from 2016:

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1.1.1 Risks to BP from climate change

The climate problem has the potential to disrupt BP's business in at least three ways:

i. Effective climate policies can emerge that discourage fossil fuel consumption, that impose environmental performance standards on production processes, and that subsidize or promote efficiency and low carbon energy.
ii. Climate-motivated research can create disruptive new energy technology.
iii. Climate impacts can directly disrupt BP's investments in energy production infrastructure and supply chains.[116]

4.125. By omitting material information about the climate impacts of their fossil fuel products, Defendants continue to profit from their decades-long deceptive campaign and ongoing uncertainty among the consuming public regarding the role of fossil fuels in harming people, the economy, and the environment.

I. Defendants misleadingly promote fossil fuel products as "green," "sustainable," "carbon-neutral," and "lowering emissions."

4.126. Defendants also advertise fossil fuel products as "environmentally friendly," "green," "sustainable," "carbon-neutral" and "lowering emissions." These claims deceptively state and imply environmental benefits that are non-existent or negligible.

4.127. In 2017, the Dutch Advertising Code Authority censured Shell and Exxon for advertising natural gas as the "cleanest fossil fuel." The Advertising Code Authority reasoned that the claim "suggested that fossil fuels can be clean in that they do not cause environmental

[116] BP. Issues Management Working Group Meeting Notes; Caspian 4.53. (Sept. 25, 2017) https://oversightdemocrats.house.gov/sites/democrats.oversight.house.gov/files/2022/BP_Redacted-Final-1.pdf p.104

damage. It is firm . . . that that suggestion is not correct."[117] Yet in the United States, all Defendants continue to advertise natural gas as clean, sustainable, environmentally-friendly, and low-emission.

4.128. For example, Shell has published numerous advertisements on national newspapers such as the New York Times and the Washington Post in which the company touts its investments in new energy sources to reduce emissions and help to "set[] the course" for a "lower-carbon mobility future." In these advertisements, Shell presents liquefied natural gas as a "cleaner source" of energy and "a critical component of a sustainable energy mix" and a "lower-carbon fuel" that could "help decrease" CO_2 emissions.[118],[119]

4.129. ConocoPhillips has released ads on Facebook stating, "Natural Gas: efficient, affordable, environmentally-friendly. Find out how natural gas is meeting global energy demand while reducing climate-related risks," and linking to a page on their website.[120]

4.130. In 2008 ConocoPhillips published this full-page ad in *The Atlantic* magazine:

[117] Nelson, Arthur. Shell and Exxon face censure over claim gas was 'cleanest fossil fuel'. (Aug. 14, 2017) https://www.theguardian.com/environment/2017/aug/14/shell-and-exxon-face-censure-over-claim-gas-was-cleanest-fossil-fuel.

[118] See, e.g., The Making of Sustainable Mobility (Content from Shell), Wash. Post, https://www.washingtonpost.com/brand-studio/shell/the-making-of-sustainable-mobility.

[119] See, e.g., Moving Forward: A Path To Net-Zero Emissions By 2070 (Shell Paid Post), N.Y. Times, https://www.nytimes.com/paidpost/shell/ul/moving-forward-a-path-to-net-zero-emissions-by-2070.html.

[120] https://twitter.com/APIenergy/status/1325211486092845057.

Figure 7: ConocoPhillips advertisement in *The Atlantic*

4.131. Contrary to the impression these claims are intended to leave, natural gas is a fossil fuel that contributes substantially to climate change. It emits significant quantities of CO_2 when burned and leaks methane throughout its lifecycle. Once methane leakages are considered, advantages of natural gas over other fossil fuels are reduced, if not eliminated. The IPCC

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estimates that methane alone is responsible for more than a third of the warming the Earth has experienced thus far.

4.132. Defendants also misleadingly market certain gasolines, motor oils, and lubricants as "green," "carbon-neutral," "environmentally-friendly," or "lowering emissions." These claims imply that Defendants' products are beneficial to the climate and can help reduce emissions. In reality, burning these fossil fuel products will increase emissions and worsen climate change, and any comparative benefit from using Defendants' products as opposed to another motor oil, gasoline, or lubricant is negligible.

4.133. For example, Chevron advertised its Techron fuel with claims that emphasize its supposed positive environmental qualities, such as: "less is more," "minimizing emissions," and "up to 50% cleaner."[121] In a Q and A on Chevron's website, one question says, "I care for the environment. Does Techron impact my car's emissions?" Chevron answers that "[g]asolines with Techron" clean up carburetors, fuel injectors, and intake valves, "giving you reduced emissions."[122]

4.134. Shell advertised that its Shell Nitrogen Enriched Cleaning System and V-Power Nitro+ Premium "produce[s] fewer emissions" and that not using them can lead to "higher emissions."[123]

4.135. Exxon advertises its Synergy Diesel Efficient fuel as the "latest breakthrough technology" and the "first diesel fuel widely available in the US" that helps "increase fuel

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[121] See, e.g., Chevron, Techron, https://www.techron.com (last visited Oct. 14, 2022).
[122] Id.
[123] See, e.g., Shell, Shell Nitrogen Enriched Gasolines, https://www.shell.us/motorist/shell-fuels/shell-nitrogen-enriched-gasolines.html (last visited Oct. 14, 2022).

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economy" and "[r]educe emissions and burn cleaner," and "was created to let you drive cleaner, smarter and longer."

4.136. Exxon also publishes online content under the banner "Energy Factor," wherein Exxon claims that it is "develop[ing] safe and reliable energy sources for the future." The Energy Factor webpage includes posts such as "Green Motor Oil? ExxonMobil Scientists Deliver an Unexpected Solution," in which Exxon promotes its green-colored motor oil, with a heading in bold typeface advertising that it can "contribute to . . . carbon dioxide emission-reduction efforts."

4.137. BP markets its Invigorate gasoline as a "cleaning agent that helps . . . give you more miles per tank," and "help[s] cars become clean, mean, driving machines," and its bp Diesel as "a powerful, reliable, and efficient fuel made" to help "reduce emissions."[124]

4.138. BP's website advertises its fuel selection as "including a growing number of lower-carbon and carbon-neutral products." BP's website also describes its Invigorate gasoline product as better than "ordinary fuels" that have problems like "increased emissions."

4.139. ConocoPhillips, through its 76-branded gas stations in Washington, offers for sale and markets 76-brand fossil fuels. In ConocoPhillips's advertisements for its 76-brand fuels ConocoPhillips claims that its fuels "clean" a car's engine, resulting in "lower emissions, and that deposits left from other gasolines "can increase emissions." ConocoPhillips advertises that 76's fossil fuels are "better for the environment." The 76 website for 76's fuels contains the marketing materials shown below, in which ConocoPhillips makes the claim—superimposed on

[124] See, e.g., BP, Our Fuels, https://www.bp.com/en_us/united-states/home/products-and-services/fuels.html (last visited Oct. 14, 2022).

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an image of a bluebird standing on a car's side mirror and looking at the viewer, with silhouetted trees in the background—that 76 and its fossil fuels align with the values of environmentally conscious consumers: "We're on the driver's side®. And the environment's."

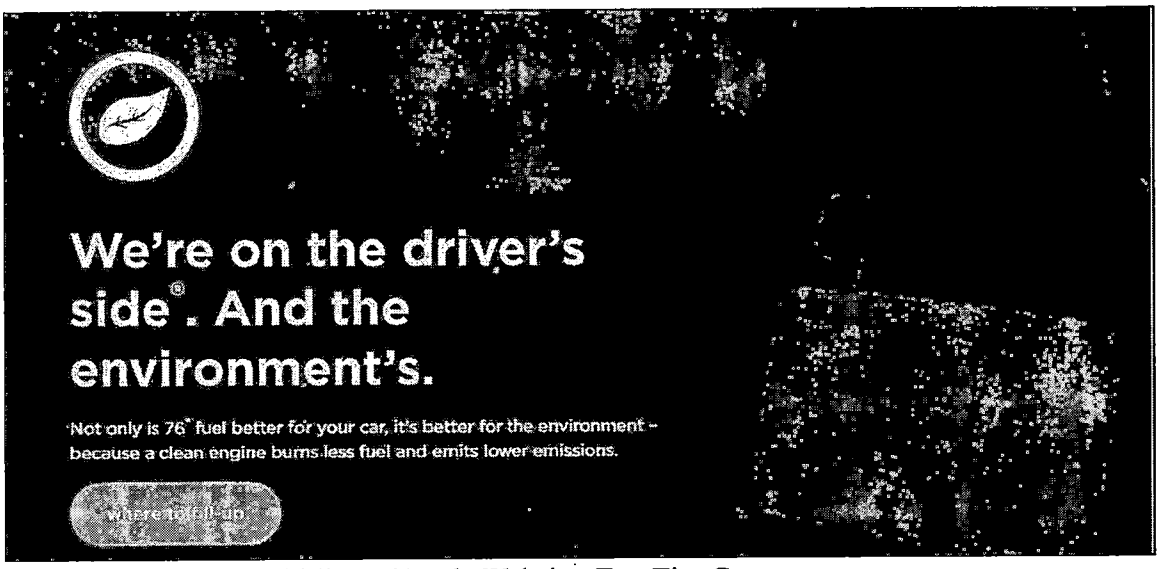


Figure 8: ConocoPhillips 76 Fuels Website: Top Tier Gas

4.140. Defendants' marketing is reminiscent of the tobacco industry's effort to promote "low-tar" and "light" cigarettes as an alternative to quitting smoking after the public became aware cigarettes caused cancer. Cigarette makers promoted "light" and "low tar" cigarettes as a healthier choice, even though the health benefits from smoking a "light" cigarette compared to a regular cigarette was negligible and any use of cigarettes was harmful. Defendants similarly aim to reassure consumers that using simply choosing their gasoline and motor oils will reduce their impact on climate change when in fact the benefits for the climate are negligible and burning all gasolines will contribute to climate change.

4.141. Cigarette makers also used scientific and engineering terms in their advertising of "light" cigarettes to enhance their credibility. Exxon's advertising for Synergy™ and "green" Mobil 1™ products similarly employs phrases like "meticulous[] engineer[ing]," "breakthrough

technology," "rigorously tested in the lab," "proprietary formulation," "test data," "engineers," "innovat[ion]," and "Scientists Deliver [] Unexpected Solution[s]."[125]

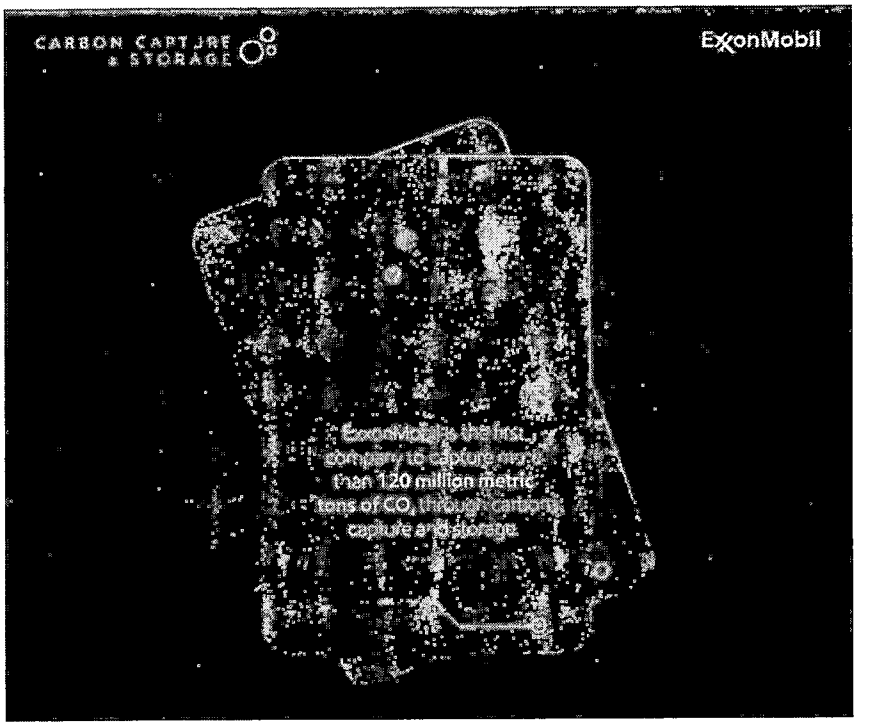
J. Defendants promote unrealistic or unproven technologies as clean energy solutions for people currently relying on Defendants' fossil fuels.

4.142. Defendants also promote unrealistic or unproven technologies as clean energy solutions for the average consumer who currently relies on Defendants' fossil fuels to power their cars or homes. These ads leave people with the deceptive impression that such technologies are currently viable, or soon to be viable, and will soon permit everyday consumers continued reliance on fossil fuels or related infrastructure, such as gas or coal-fired power plants or internal combustion engines for cars. Defendants omit material information and context for these claims, as described in the below illustrative examples:

4.143. Exxon regularly advertises its efforts to capture and store carbon, leaving consumers with the impression that Exxon does this to benefit the climate. Exxon does not disclose that the massive energy required to capture that carbon is powered by fossil fuels emitting more greenhouse gasses into the air[126] Further, nearly all the carbon Exxon has captured was not simply stored, but used to drill for more oil.

[125] See, e.g., EnergyFactor by ExxonMobil, Green Motor Oil? ExxonMobil Scientists Deliver an Unexpected Solution (July 19, 2016); Exxon Mobil, Fuels, https://www.exxon.com/en/fuels (last visited Oct. 14, 2022).

[126] Kusnetz, Nicholas. Exxon's Long-Shot Embrace of Carbon Capture in the Houston Area Just Got Massive Support from Congress. (Sept. 25, 2022) https://insideclimatenews.org/news/25092022/exxon-houston-ship-channel-carbon-capture/



4.144. For almost a decade, Exxon also claimed it had a new climate solution: algae biofuels. As recently as 2018, Exxon claimed it would be producing 10,000 barrels of algae biofuel by 2025 and that this fuel could reduce "carbon emissions from transportation" by more than fifty percent.[127] In 2019, Exxon continued to advertise that "it is growing algae for biofuels that could one day power planes, propel ships, and fuel trucks, and cut their emissions in half."[128]

4.145. Exxon ultimately invested just $335 million of the $600 million it had promised to develop the technology before quietly pulling the plug on the project in December 2022.[129]

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[127] The Future of Energy? It May Come From Where You Least Expect (ExxonMobil Paid Post), N.Y. Times, https://www.nytimes.com/paidpost/exxonmobil/the-future-of-energy-it-may-come-from-where-you-least-expect.html.

[128] Exxon Mobil TV Spot, 'Alge Potential'. (Oct. 19, 2019) https://www.ispot.tv/ad/ovGn/exxon-mobil-algae-potential.

[129] Big oil firms touted algae as climate solution. Now all have pulled funding. The Guardian. (March 17, 2023). https://www.theguardian.com/environment/2023/mar/17/big-oil-algae-biofuel-funding-cut-exxonmobil.

4.146. On information and belief, Exxon spent nearly half as much as its actual investment in developing algae biofuel on advertising its commitment to algae biofuels.[130]

4.147. On information and belief, Exxon's $335 million investment in algae was far short of the several billion dollars that algae researchers believe is necessary to commercialize algae biofuels.[131]

4.148. In addition to not disclosing the miniscule scale of these efforts, Exxon's ads do not acknowledge that Exxon's biodiesel fuel is generally a blend that uses only 5% to 20% biofuel, with the remainder composed of fossil fuel. Thus, Exxon's greenwashing ads misleadingly overstate both the "sustainable" or "environmentally friendly" nature of its biodiesel investment as well as its scale.

170. In another advertisement published in the Washington Post, Shell touts hydrogen fuel cell technology, promoting hydrogen as "[o]ne of the cleaner sources" that power electric vehicles, stating that "[h]ydrogen fuel cell vehicles . . . emit nothing from their tailpipes but water vapor."[132]

4.149. In an online video, Shell advertised hydrogen fuels for cars to potential consumers in lieu of electric vehicles. Shell claimed:

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[130] Big oil firms touted algae as climate solution. Now all have pulled funding. The Guardian. (March 17, 2023). https://www.theguardian.com/environment/2023/mar/17/big-oil-algae-biofuel-funding-cut-exxonmobil. (In its 12 years in the space, Exxon invested $350m in algae biofuels, according to spokesperson Casey Norton. (Norton says that's more than double what the company spent on touting this research in ads.)")

[131] Big oil firms touted algae as climate solution. Now all have pulled funding. The Guardian. (March 17, 2023). https://www.theguardian.com/environment/2023/mar/17/big-oil-algae-biofuel-funding-cut-exxonmobil.

[132] The Mobility Quandary. (Shell Paid Post). The Washington Post. https://www.washingtonpost.com/brand-studio/shell/the-mobility-quandary/

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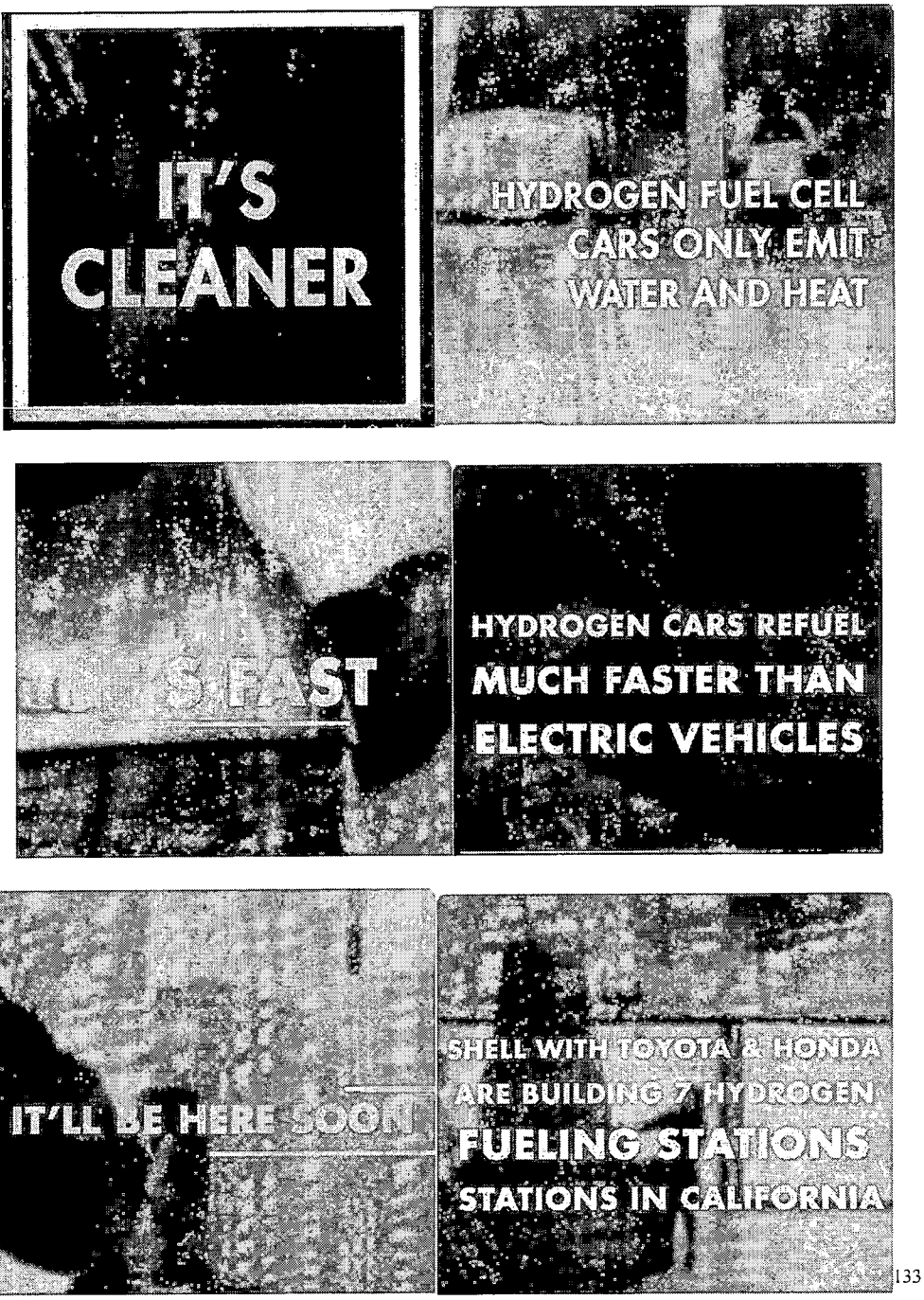

[133]

[133] @Shell_USA. A car that only emits water and heat? Learn more about #hydrogen, a fuel for the future that can help clean up transport today. X (formerly Twitter). (Dec. 20, 2017). https://twitter.com/Shell_USA/status/943401985193242625?ref_src=twsrc%5Etfw%7Ctwcamp%5Eembeddedtimeline%7Ctwterm%5Escreen-name%3Ashell_usa%7Ctwcon%5Es1.

4.150. Shell admitted elsewhere – but not in these advertisements – that "most of hydrogen today is produced from fossil fuels such as natural gas," including the hydrogen that Shell provided to consumers at their hydrogen fueling stations in California.[134] As of 2021, fossil fuels produced more than 99 percent of hydrogen on the market.[135]

4.151. As with most of Defendants' short-lived but highly publicized investments in "clean energy solutions," Shell subsequently closed the five stations aimed at hydrogen fueling for passenger cars and "confirm[ed] that Shell has discontinued its plan to build and operate additional light-duty vehicle fueling stations in California." [136]

K. Defendants misleadingly promote themselves as clean energy companies actively working to achieve net-zero emissions.

4.152. Defendants' representations and omissions described above imply that Defendants are clean energy companies actively working to solve climate change, but Defendants do not stop there. Defendants actively promote their brand to consumers as a clean energy business, even claiming that they are working to achieve net zero emissions. Defendants' promotions are false, misleading, and unfairly compete with other businesses who are primarily engaged in supplying clean energy.

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[134] Carbon Neutral Hydrogen. Shell United States. https://www.shell.us/motorist/shell-hydrogen-california-retail-hrs-project.html.

[135] Global Hydrogen Review 2022. International Energy Agency. (Sept. 2022) pg. 71. https://www.iea.org/reports/global-hydrogen-review-2022.

[136] Carbon Neutral Hydrogen. Shell United States. https://www.shell.us/motorist/shell-hydrogen-california-retail-hrs-project.html.; Dokso, Anela. Shell Abandons California Hydrogen Stations. H2 Energy News. (Sept. 19, 2023). https://energynews.biz/shell-abandons-california-hydrogen-stations/#:~:text=In%20essence%2C%20Shell%20has%20shuttered,California%20due%20to%20operational%20issues.

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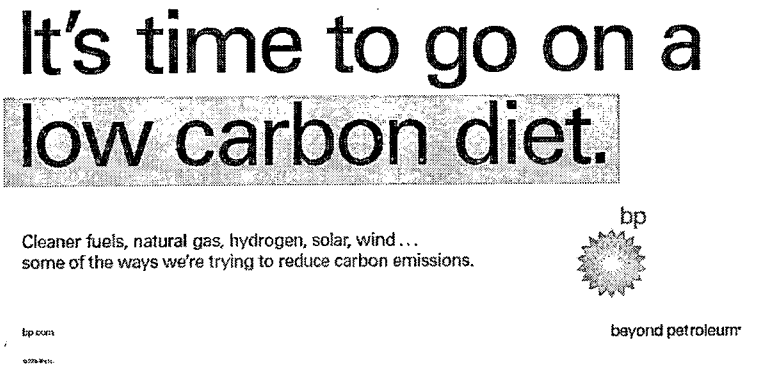
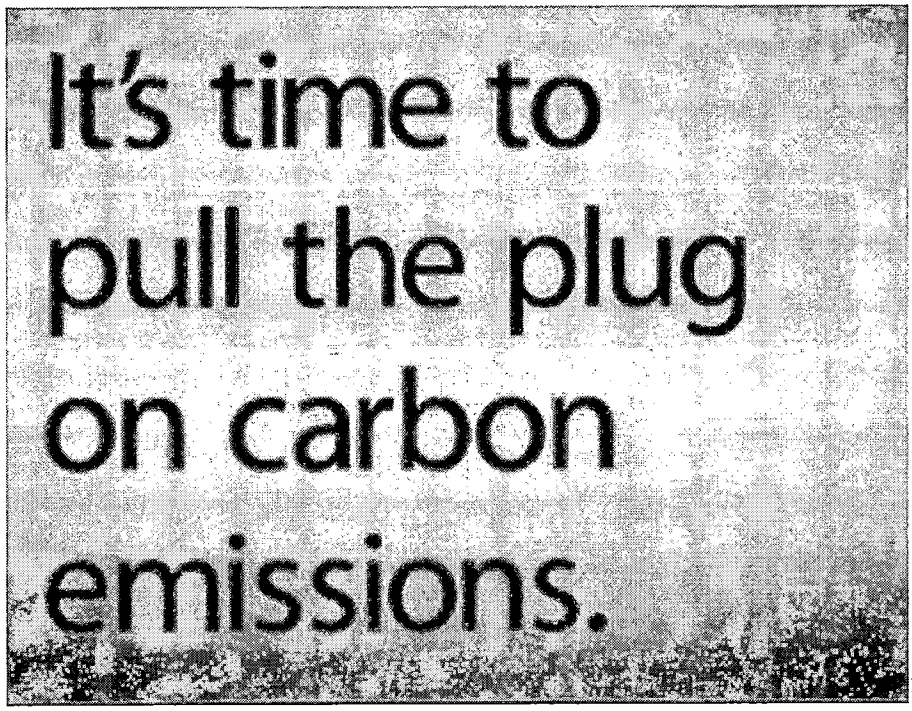
4.153. Recognizing the potential to capture market share of "green" consumers, BP was an early adopter of these tactics. For over two decades, BP claimed to consumers that it was moving "beyond petroleum," "advancing the energy transition,"[137] and "transforming itself"[138] to become a net zero energy business.

4.154. Beginning in 2000, BP began a $200 million campaign claiming it was moving "beyond petroleum" with advertisements portraying BP as predominantly invested in clean energy sources. Messages from that campaign included some projects, plans, and an overall theme that BP was going to materially reduce its emissions and transition away from petroleum:



[137] BP. BP's Shift to Gas. Youtube. (Dec. 6 2017) https://www.youtube.com/watch?v=ILwpc5MUmUM.
[138] Our Transformation. BP. (Sept. 4, 2023). https://www.bp.com/en/global/corporate/who-we-are/our-transformation.html.



[139]

[139] BP Advert (Revised) Beyond Petroleum Ad. Youtube. (May 10, 2007). https://www.youtube.com/watch?v=irDhWudV-7w&list=PL4SVnWogxWYvFLayEJM3phaX8EbD9Pz0J&index=7

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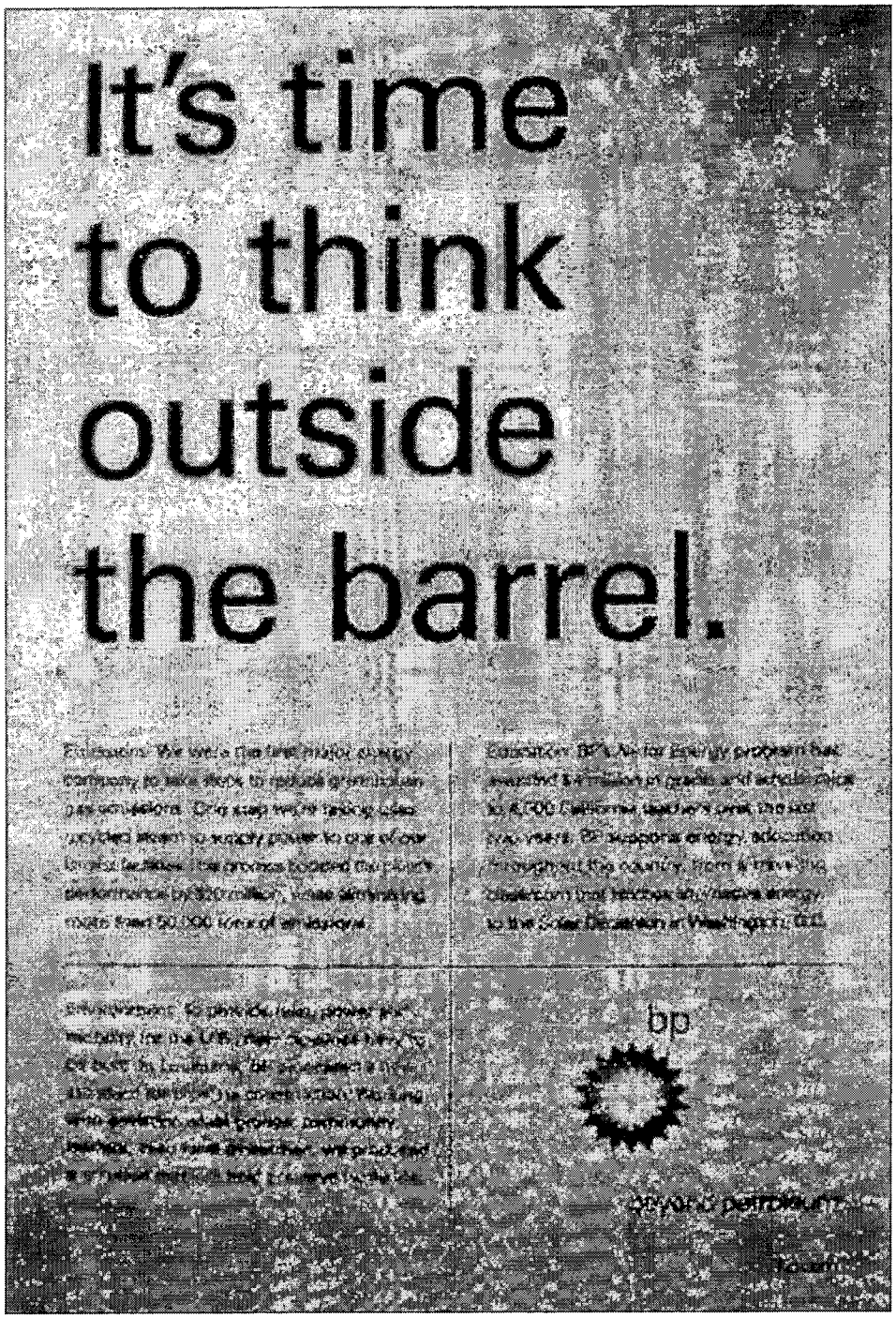

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4.155. BP succeeded in persuading consumers that it was an eco-friendly company, capturing consumer demand for oil companies to respond to the threat of climate change.[140] From 2000 to 2007, according to BP, its brand awareness went from four percent to 67 percent.[141]

4.156. In reality, BP's investments in clean energy was only a small percentage of its total capital expenditure during this period. The vast majority of BP's investments during this period were to increase fossil fuel exploration, production, refining, and marketing.[142]

4.157. Though BP abandoned the "beyond petroleum" moniker in 2013, BP continues to portray itself to consumers as predominantly invested in clean energy.

4.158. In more recent years, BP has run advertisements intended to "advance and protect the role of gas – and BP – in the future of energy conversation."[143] These advertisements claim natural gas is a clean energy source, similar to renewables, and, through its production of natural gas, BP is "advancing the energy transition."[144]

4.159. In 2019, BP's CEO announced it was, once again, time to "let people know we are engaged in this big energy transition and have a big core business." BP launched the "Possibilities Everywhere" campaign. The advertising campaign once again exaggerated BP

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[140] Cherry, Miriam A. et al. Beyond Profit: Rethinking Corporate Social Responsibility and Greenwashing After the BP Oil Disaster. Saint Louis University School of Law. (2011) pg. 1002-1008. (describing the "halo created by a decade of smart advertising" that positioned BP on the green side of energy development and how environmentalists had rated BP as the "eco-friendly gas station choice") https://scholarship.law.slu.edu/cgi/viewcontent.cgi?article=1375&context=faculty.

[141] Nastu, Jennifer. 'Beyond Petroleum' Pays Off for BP. Environment and Energy Leader. (Jan. 15, 2008) https://www.environmentenergyleader.com/2008/01/beyond-petroleum-pays-off-for-bp/

[142] Annual Report and Accounts 2008. BP. https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/investors/bp-annual-report-accounts-2008.pdf.

[143] Brunswick Advocacy Campaign document at 2.

[144] BP. BP's Shift to Gas. Youtube. (Dec. 6 2017) https://www.youtube.com/watch?v=ILwpc5MUmUM

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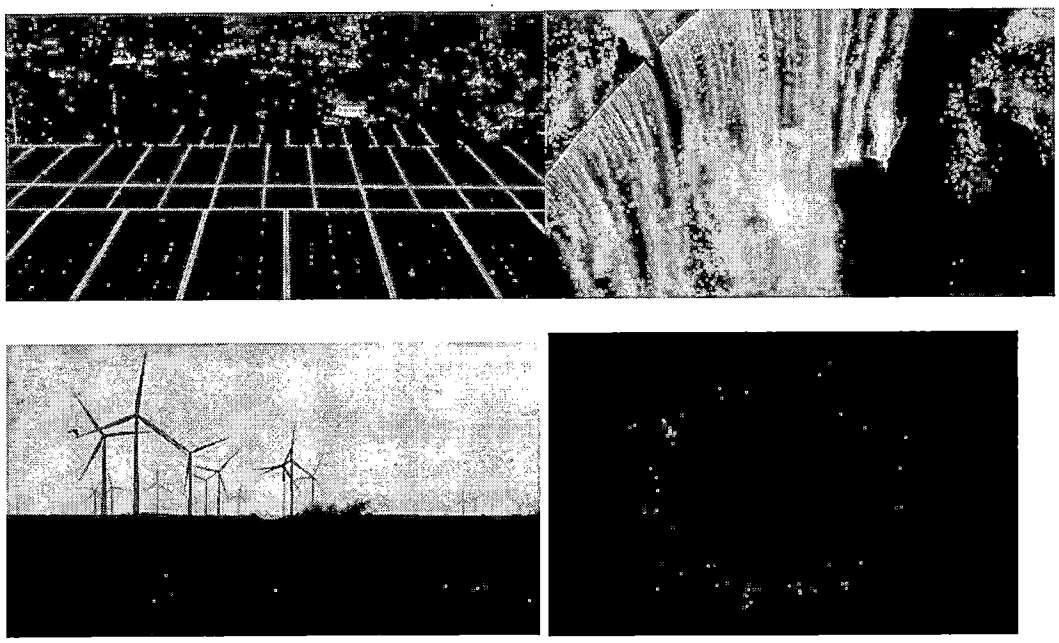
investments in clean energy and (alleged) support for a clean energy transition and misleadingly portrayed natural gas as a clean energy similar to wind and solar power.[145]

4.160. One Possibilities Everywhere advertisement from 2020, called "Advancing," BP shows imagery of drought and storms, alluding to climate change. BP then states the world needs energy "that is kinder to our planet." Such energy sources are "cleaner, greener, smarter energy." BP presents images of those energy sources: solar, hydro, and wind power alongside natural gas, implying that natural gas is also a clean, green energy:



[145] Farand, Chloe. BP's First Global Advertising Campaign Since Deepwater Horizon Accused of Being 'Deceptive and Hypocritical'. DeSmog. https://www.desmog.com/2019/01/29/bp-first-global-advertising-campaign-deepwater-horizon-accused-greenwashing-deceptive/.

Finally, BP presents itself as leading that transition: "With our scale and know-how, our partnerships and new investments, we'll search for energy the world needs to progress, seeking new possibilities in everything, everywhere."[146]

4.161. In another ad, called "Blade Runners," BP described itself as "one of the major wind energy businesses in the US."[147] Yet, at the time of this advertisement in 2019, BP owned approximately 1.7 gigawatts ("GW") of wind capacity, which is dwarfed by other companies including GE, Siemens, and Vestas (with about 39 GW, 26 GW, and 23 GW capacities, respectively).[148] And BP's total wind capacity was just roughly one percent of total installed wind power in the United States.[149]

4.162. WPP, one of BP's public relations firms, describes BP's strategy at this time to portray BP as "advancing the energy transition" [150]:

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[146] BP Keep Advancing Advertisement. https://www.dropbox.com/s/dgzea4w30tfbnc9/2020_B143196_BP_Advancing_video_edits__US-UK_MASTER_PR002.mp4?dl=0.

[147] Blade Runners. BP. (2019). https://web.archive.org/web/20191130192545/https://www.bp.com/en/global/corporate/who-we-are/possibilities-everywhere/wind-and-natural-gas.html.

[148] For BP's wind capacity, see: Press Release. BP Advances Offshore Wind Growth Strategy (Feb. 8, 2021), https://www.bp.com/en/global/corporate/news-and-insights/press-releases/bp-advances-offshore-wind-growth-strategy.html For wind capacity of GE, Siemens, and Vestas, see: McClain, Abby. The 15 Largest Wind Power Companies in the World (April 18, 2023), https://www.zippia.com/advice/largest-wind-power-companies/.

[149] Ingram, Elizabeth. U.S. wind capacity grew 8% in 2018, AWEA says. Renewable Energy World. (April 10, 2019). https://www.renewableenergyworld.com/wind-power/onshore/u-s-wind-capacity-grew-8-in-2018-awea-says/.

[150] BP Creative Workshop Briefing Document. WPP. (Jan. 14, 2020) https://www.documentcloud.org/documents/20073850-bp-creative.

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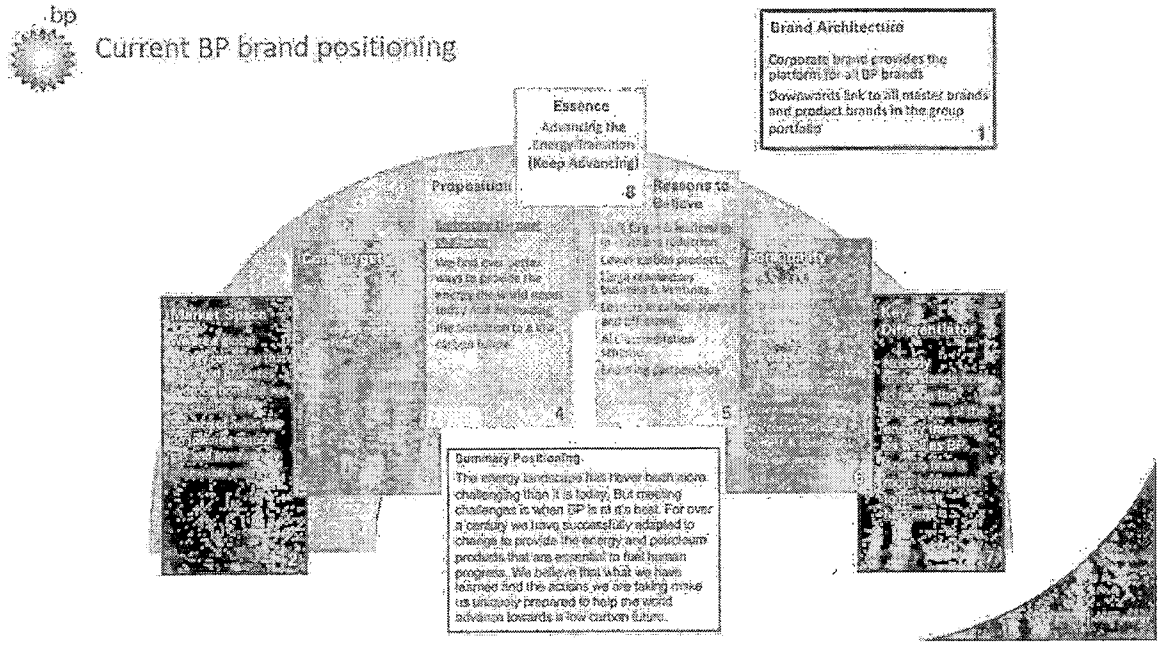
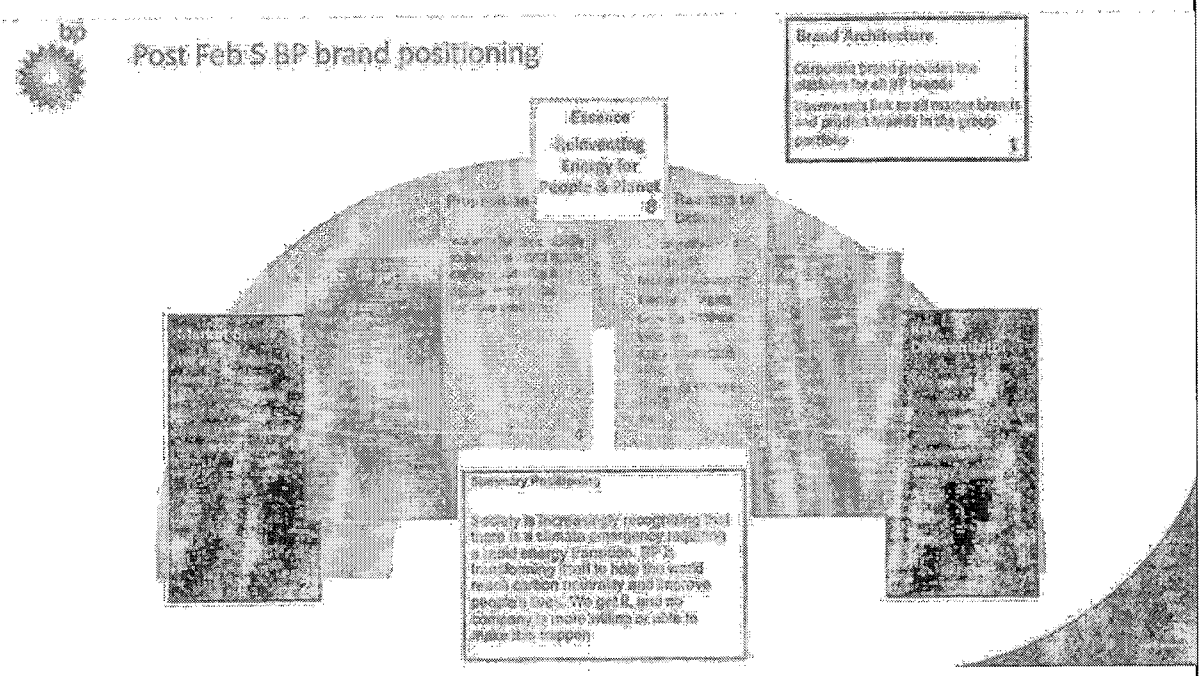


4.163. Acknowledging that "[s]ociety is increasingly recognizing that there is a climate emergency requiring a rapid energy transition," BP then adjusted their brand positioning to reinvent itself as "transforming . . . to help the world reach carbon neutrality and improve people's lives. We get it, and no company is more willing or able to make this happen."[151]

[151] BP Creative Workshop Briefing Document. WPP. (Jan. 14, 2020) https://www.documentcloud.org/documents/20073850-bp-creative.



4.164. Other Defendants have followed suit, seeking to portray themselves as clean energy businesses leading the transition away from fossil fuels.

4.165. Shell launched the "Make the Future" campaign, which presents various *ideas* of how one could reduce emissions or develop clean energy as well as Shell's "target" to achieve net zero emissions.

4.166. For example, one of Shell's Make the Future advertisements included a video describing the company's "target" to achieve net zero emissions[152]:

[152] Sponsored Advertisement by Shell. By working together, we can achieve a net-zero emissions world. Click to learn more. #MakeTheFuture. Facebook. (May 10, 2021 to June 27, 2021). https://www.facebook.com/ads/library/?active_status=all&ad_type=political_and_issue_ads&country=US&id=487103519201014&view_all_page_id=200969413280005&search_type=page&media_type=all

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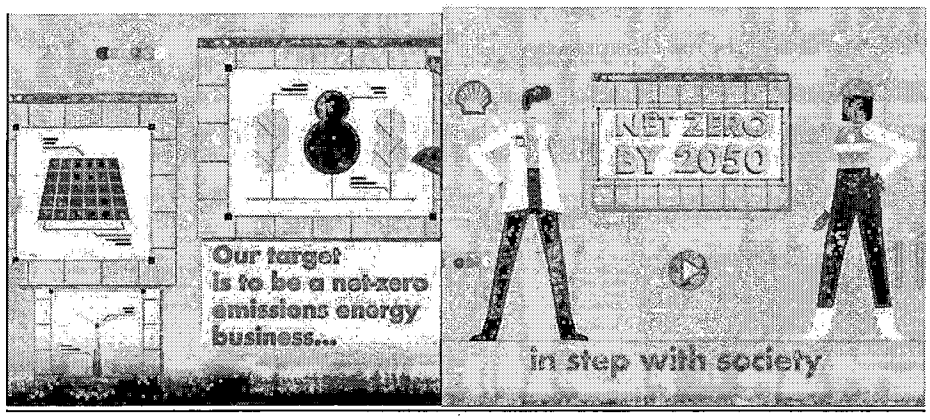
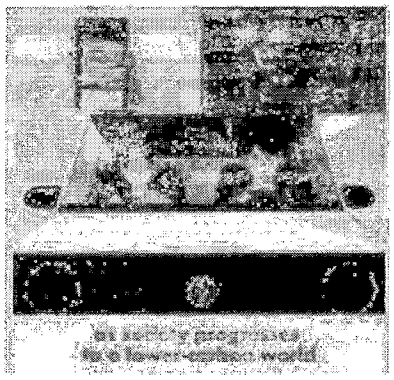
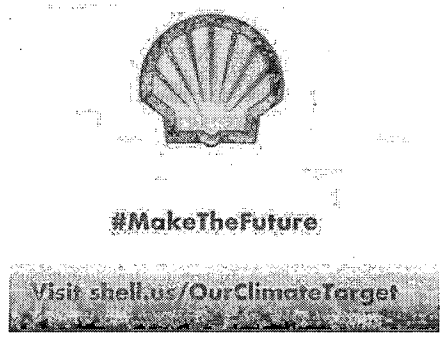

Our target is to be a net-zero emissions energy business...
NET ZERO BY 2050
in step with society




#MakeTheFuture
Visit shell.us/OurClimateTarget

4.167. If a person clicks on the link to Shell's website, they will see images of wind turbines and solar panels as they scroll through pages of how Shell is "Tackling climate change," helping to achieve the goal "laid out in the Paris Agreement," and is "transforming our business" to meet their target of net zero emissions. They will read about how Shell provides renewable electricity and electric vehicle charging, is restoring habitats and clean water through reforestation efforts, and even has an "approach to a fair and just transition." All this gives an impression that Shell ***is***, currently, transforming its business to reduce emissions. Yet, after scrolling through all this information, the reader may click on a "legal disclaimer." Buried in the middle of the disclaimer, Shell states: "Shell's operating plans, outlooks, budgets and pricing assumptions do not reflect our net-zero emissions target."[153]

4.168. One of Shell's public relations firms aptly describes the intent of Shell's Make The Future campaign as follows:[154]

[153] Our Climate Target. Shell United States. https://www.shell.us/energy-and-innovation/our-climate-target.html?utm_source=facebook&utm_medium=social&utm_content=fv_4_0015&utm_campaign=nz_ld_us_apr-jun_2021&linkId=117937083#iframe=L3dlYmFwcHMvY2xpbWF0ZV9hbWJpdGlvbl9VU19OZXRfemVyb18yMDIyLw

[154] Shell South Pole Energy Challenge. Edelman via archive.today. (Acc. Jul 25, 2023). https://archive.ph/IZ8Qz

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> As part of their efforts to make consumers, particularly millennials, aware of their commitment to cleaner energy, Shell launched the #makethefuture campaign. The company tasked Edelman with the job of giving millennials a reason to connect emotionally with Shell's commitment to a sustainable future. We needed them to forget their prejudices about "big oil" and think differently about Shell.

4.169. Following an advertising campaign linking Shell to a polar expedition using renewable fuels, Edelman stated the "Business Outcome" of its campaign, which included:

> - Audience members are 31% more likely to believe Shell is committed to cleaner fuels.
> - Positive attitudes towards the brand increased by 12%

4.170. Mediacom, another public relations firm working on Shell's "Make the Future" campaign, candidly stated that "Shell's 'Make The Future' communications ultimately seek to change or enhance the perception of the brand among all potential customers and stakeholders."[155] The "target audience" for their project included an "'Energy Engaged Customer' (EEC) audience – 18-54 years old, curious, open-minded and outward-looking individuals who are also potential customers of Shell's products and services. Our mission was to recruit, engage and ultimately improve perception of the Shell brand." To deliver on the mission, the firm would create content showing *ideas* to decarbonize the home, reduce emissions of passenger cars, make deliveries more efficient, and plan an all-electric journey.

[155] Winner 2021, Corporate Influencer, Shell, Mediacom, Pitch the Future. World Media Group. (2021). https://world-media-group.com/case-study/pitch-the-future-case-study-2021/

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4.171. In other words, Shell's advertising campaign focuses on its net zero "target," as well as ideas or possibilities to decarbonize, leaving consumers with the impression that this is a primary focus of Shell's business.

4.172. In reality, Shell planned to spend four times more money on oil and gas development than on renewable technology in 2022.[156] Independent analysis of Shell's spending plans shows that the company will be emitting more greenhouse gas by 2030 than it currently emits.[157] On its current trajectory, Shell is projected to miss its emissions reduction targets for both 2030 and 2050.[158]

4.173. In June 2023, the U.K.'s Advertising Standards Authority banned Shell's marketing campaign describing Shell as providing renewable energy, installing electric vehicle charging, and driving the energy transition. The Advertising Standards Authority found consumers were likely to interpret the marketing materials as making a "broader claim about Shell as a whole providing cleaner energy." Since the "vast majority" of its operations was not clean energy, the campaign was misleading.[159]

4.174. ConocoPhillips claims its "actions for our oil and gas operations are aligned with the aims of the Paris Agreement" and touts its actions and achievements toward the net-zero energy transition. ConocoPhillips also touts its "Net-Zero Roadmap," which it describes as a "Paris-Aligned Climate Risk Strategy" and "a comprehensive framework with an ambition to

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[156] Simon Jack, Oil Giant Shell Says It Needs Oil to Pay for Green Shift, BBC News (Nov. 3, 2021), https://www.bbc.com/news/business-59154930.
[157] Id.
[158] Id.
[159] Id.
[159] Id.

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become a net-zero company for operational emissions by 2050."[160] ConocoPhillips thus focuses on its "operational" emissions while ignoring that combustion of its product continues to emit large amounts of greenhouse gases.

4.175. In June 2023, ConocoPhillips published a profile on its Methane Measurement Manager Milind Bhatte, who it claims is helping move the company to its "goal" of "net-zero."[161]

4.176. Chevron and Exxon have engaged in similar efforts to portray themselves as predominantly invested in clean energy and leading the energy transition.

4.177. Functionally, Defendants have cut fossil fuels from their branding efforts--but not their business operations. According to one analysis, between 2010 and 2018, BP spent 2.3% of total capital spending on low-carbon energy sources, Shell spent 1.2%, Chevron and Exxon just 0.2% each, and ConocoPhillips 0.0%.[162]

4.178. Rather than reducing emissions, Defendants are ramping up fossil fuel production like never before. Exxon is projected to increase oil production by more than 35% between 2018 and 2030—a sharper rise than over the previous 12 years.[163] Shell is forecast to increase output by 38% by 2030, by increasing its crude oil production by more than half and its gas production

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[160] https://www.conocophillips.com/; https://www.conocophillips.com/sustainability/low-carbon-technologies/operational-net-zero-roadmap/.

[161] https://www.conocophillips.com/spiritnow/story/milind-bhatte-progressing-toward-net-zero/?utm_medium=osocial&utm_source=Twitter&utm_content=image&utm_term=post:1666504399403316370&utm_campaign=campaign:1601648882546323569.

[162] Anjli Raval & Leslie Hook, Oil and Gas Advertising Spree Signals Industry's Dilemma, Financial Times (Mar. 6, 2019), https://www.ft.com/content/5ab7edb2-3366-11e9-bd3a-8b2a211d90d5.

[163] Jonathan Watts et al., Oil Firms to Pour Extra 7m Barrels Per Day Into Markets, Data Shows, The Guardian (Oct. 10, 2019), https://www.theguardian.com/environment/2019/oct/10/oil-firms-barrels-markets.

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by over a quarter.[164] BP is projected to increase production of oil and gas by 20% by 2030.[165] Chevron set an oil production record in 2018 of 2.93 million barrels per day.[166] A 2019 investor report touted Chevron's "significant reserve additions in 2018" in the multiple regions in North America and around the world, as well as significant capital projects involving construction of refineries worldwide.[167] ConocoPhillips' new Willow Project in Alaska is expected to produce approximately 576 million barrels of oil, with associated indirect GHG emissions equivalent to *239 million tons of CO_2.*

L. Alternative energy technologies, including some developed by Defendants, could have replaced or significantly reduced fossil fuel dependence.

4.179. Opportunities to reduce the use of fossil fuels and associated greenhouse emissions, mitigate the harms associated with the use and consumption of fossil fuels, and promote development of alternative, clean energy sources have been available for decades. Indeed, Defendants themselves developed some of these technologies, though they did not promote them. Examples include, but are not limited to:

a. In 1963, Esso (Exxon Mobil) obtained multiple patents on technologies for fuel cells,[168] including on the design of a fuel cell and necessary electrodes,[169] and on a

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[164] Id.
[165] Id.
[166] Kevin Crowley & Eric Roston, Chevron Aligns Strategy with Paris Deal But Won't Cap Output, Bloomberg (Feb. 7, 2019), https://www.bloomberg.com/news/articles/2019-02-07/chevron-pledges-alignment-with-paris-accord-but-won-t-cap-output.
[167] Chevron, Chevron 2019 Investor Presentation (Feb. 2019), https://chevroncorp.gcs-web.com/static-files/c3815b42-4deb-4604-8c51-bde9026f6e45.
[168] Fuel Cells, Hydrogen and Fuel Cell Technologies Office. Department of Energy: Office of Energy Efficiency and Renewable Energy. https://www.energy.gov/eere/fuelcells/fuel-cells.
[169] ExxonMobil Research Engineering Co., Patent US3116169A: Fuel cell and fuel cell electrodes (granted Dec. 31, 1963), https://www.google.com/patents/US3116169.

process for increasing the oxidation of a fuel, specifically methanol, to produce electricity in a fuel cell.[170]

b. In 1970, Esso (Exxon Mobil) obtained a patent for a "low-polluting engine and drive system" that used an interburner and air compressor to reduce pollutant emissions, including CO_2 emissions, from gasoline combustion engines (the system also increased the efficiency of fossil fuels used in such engines, thereby lowering the amount of fossil fuel product necessary to operate engines equipped with this technology).[171]

c. A 1989 article in a publication from Exxon Corporate Research for company use only stated: "Since energy generation from fossil fuels dominates modern CO2 emissions, strategies to limit CO2 growth focus near term on energy efficiency and long term on developing alternative energy sources. Practiced at a level to significantly reduce the growth of greenhouse gases, these actions would have substantial impact on society and our industry—near-term from reduced demand for current products, long term from transition to entirely new energy systems."[172]

d. In 1973, Shell obtained a patent for a process to remove acidic gases, including CO_2, from gaseous mixtures.[173]

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[170] ExxonMobil Research Engineering Co., Patent US3113049A: Direct production of electrical energy from liquid fuels (granted Dec. 3, 1963), https://www.google.com/patents/US3113049.
[171] ExxonMobil Research Engineering Co., Patent US3513929A: Low-polluting engine and drive system (granted May 26, 1970), https://www.google.com/patents/US3513929.
[172] Flannery, Brian. Greenhouse Science, Connections: Corporate Research, Exxon Research and Engineering Company (Fall 1989), http://www.climatefiles.com/exxonmobil/1989-exxon-mobil-article-technologys-place-marketing-mix.
[173] Shell Oil Co., Patent US3760564A: Process for the removal of acidic gases from a gas mixture, (granted Sept. 25, 1973), https://www.google.com/patents/US3760564A.

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e. Phillips Petroleum Company (ConocoPhillips) obtained a patent in 1966 for a "Method for recovering a purified component from a gas" outlining a process to remove carbon from natural gas and gasoline streams.[174]

4.180. Defendants have been aware for decades that clean energy presents a feasible alternative to fossil fuels. In 1980, Exxon forecasted that non-fossil fuel energy sources, if pursued, could penetrate half of a competitive energy market in approximately 50 years.[175] This internal estimate was based on extensive modeling within the academic community, including research from David Rose at the Massachusetts Institute of Technology which concluded that a transition to non-fossil energy could be achieved in around 50 years. Exxon circulated an internal memo approving of Rose's conclusions, stating they were "based on reasonable assumptions."[176]

4.181. Likewise, a 1987 Shell briefing on "Synthetic Fuels and Renewable Energy" noted that while "immediate prospects" were "limited," "nevertheless it is by pursuing commercial opportunities now and in the near future that the valuable experience needed for further development will be gained." The brief also noted that "the task of replacing oil resources is likely to become increasingly difficult and expensive and there will be a growing need to develop lean, convenient alternatives. Initially these will supplement and eventually replace valuable oil products. Many potential energy options are as yet unknown or at very early stages of research and development. New energy sources take decades to make a major global

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[174] Phillips Petroleum Co., Patent US3228874A: Method for recovering a purified component from a gas (granted Jan. 11, 1966), https://patents.google.com/patent/US3228874.

[175] H. Shaw and P. P. McCall, Exxon Research and Engineering Company's Technological Forecast: CO2 Greenhouse Effect 5 (Dec. 18, 1980). https://insideclimatenews.org/wp-content/uploads/2015/09/Technological-Forecast-on-CO2-Greenhouse-Effect-1980.pdf.

[176] CO2 Greenhouse Effect: A Technical Review, Coordination and Planning Division, Exxon Research and Engineering Company 18 (Apr. 1, 1982).

contribution. Sustained commitment is therefore needed during the remainder of this century to ensure that new technologies and those currently at a relatively early stage of development are available to meet energy needs in the next century."[177]

4.182. Despite the knowledge that alternative energies presented a viable alternative and that it was important to begin the transition as soon as possible, Defendants chose to delay this transition by deceiving consumers and the public.

M. Defendants' wrongful conduct is a proximate cause of the Tribe's harms.

4.183. Defendants' actions in concealing the dangers of, promoting false and misleading information about, and engaging in massive campaigns to promote increasing use of fossil fuels have succeeded in misleading consumers and the public in Washington, including on the Shoalwater Bay Reservation, and elsewhere about the climate impacts of using fossil fuels, depriving people of the truth about the consequences of their decisions to buy and use fossil fuels and technologies dependent on fossil fuels. Further, Defendants' conduct has obstructed and delayed the introduction and adoption of alternative, low-carbon technologies. Defendants have succeeded in delaying the transition to alternative, low-carbon technologies, deepened consumers' dependence on fossil fuels, driven increased use of oil and gas, and contributed substantially to the buildup of carbon dioxide in the atmosphere that causes global warming and its physical, environmental, and socioeconomic consequences, including those affecting and harming the Shoalwater Bay Tribe.

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[177] Synthetic Fuels and Renewable Energy, Shell Service Briefing, no. 2, 1987, https://assets.documentcloud.org/documents/4411089/Document2.pdf.

4.184. Defendants' deceptive and tortious conduct as described in this Complaint is a proximate cause of devastating climate change impacts to the Shoalwater Bay Tribe, including: sea-level rise, more frequent and intense rainfall, and flooding, more frequent and intense heat waves, more frequent and intense droughts, more frequent, hotter, and more devastating wildfires, ocean acidification, degradation of air and water quality, harms to human health, and loss of habitat and species.

4.185. The increased consumption of fossil fuels induced by the Defendants' tortious and deceptive conduct caused, and will continue to cause, the release of huge amounts of otherwise avoidable greenhouse gases, thereby ensuring that the damage to the Shoalwater Bay Tribe resulting from climate change will be severe and ongoing for decades to come.

N. The Tribe has sustained, and will sustain, substantial harms and losses.

4.186. The Tribe has incurred, and will foreseeably continue to incur, injuries and damages of increasing severity due to the climate crisis proximately caused by Defendants' tortious and deceptive conduct as described in this Complaint. These injuries and damages include but are not limited to: injury or destruction of Tribal-owned or -operated facilities and property deemed critical for operations, utility services, and risk management, destruction of Tribal natural resources, as well as other assets essential to community health, safety, and well-being; increased planning and preparation costs for community adaptation and resilience to climate change's effects; and increased costs associated with public health impacts, environmental impacts, and economic impacts.

4.187. For example:

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a. With its reservation adjacent to the Pacific Ocean, the Shoalwater Bay Tribe is particularly vulnerable to severe harms and damages from sea-level rise. The Tribe has experienced and will continue to experience significant and accelerating sea-level rise over the coming decades.[178] The Tribe's residents and its essential governmental infrastructure are at such a high risk of coastal flooding now and in the coming decades that they most relocate to uplands.

b. The destructive force and flooding potential from storm surges during coastal storms and other weather events have increased as the mean sea level of the Shoalwater Bay Reservation has increased, and the combined effects of storm surge and sea-level rise will continue to exacerbate flooding impacts upon the Tribe and its Reservation. Even if all carbon emissions were to cease immediately, the Tribe would continue to experience sea-level rise due to the greenhouse gases already released from burning fossil fuels, and the lag time between emissions and sea-level rise.

c. Climate change is expected to significantly alter the frequency and intensity of precipitation events on and affecting the Shoalwater Bay Reservation. By 2100, annual precipitation levels on the Shoalwater Bay Reservation, are projected to rise up to 5.3 inches.[179]

d. The Tribe has already incurred significant costs on projects to address sea-level rise, including but not limited to: planning for and moving governmental infrastructures, service facilities, and housing for the Tribe's citizens to higher ground and planning for

[178] https://climate.northwestknowledge.net/NWTOOLBOX/tribalProjections.php.
[179] https://climate.northwestknowledge.net/NWTOOLBOX/tribalProjections.php.

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adaptation and/or rerouting reservation roads that are being destroyed by sea-level rise, attending storm surges, and flooding.

e. Climate change is causing more extreme weather events in and on the Shoalwater Bay Reservation, with attendant physical and environmental consequences, including coastal flooding, coastal erosion, inland flooding, extreme heat events, and drought.

f. Climate change is reducing winter snow pack, increasing surface water temperatures, reducing low flows while increasing peak flows during extreme precipitation events, threatening aquatic life as well as the Tribe's water supplies.

g. Oceans are acidifying at an alarming rate because of fossil-fuel burning, endangering the Tribe's coastal ecosystems and economy.

h. The average air temperature has increased and will continue to increase in and on the Shoalwater Bay Reservation due to climate change. Annual average daily temperatures on the Reservation have already increased over 2°F compared to historic levels, and are projected to increase as much as 7.2°F over historic levels by the end of the century.[180] Warming air temperatures lead to poorer air quality, more heat waves, expanded pathogen and pest ranges, bigger, more intense, and more destructive wildfires, thermal stress for native flora and fauna, and threats to human health—such as from heat stroke and dehydration, due to increased evaporation and demand, and increased allergen exposure. Rising air temperatures will increase ground-level concentrations of ozone and particulate matter, raising the incidence of serious health risks like respiratory distress, cancer, chronic obstructive pulmonary disease

[180] https://climate.northwestknowledge.net/NWTOOLBOX/tribalProjections.php.

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("COPD"), and cardiovascular disease among Shoalwater Bay citizens, particularly among children, the elderly, and other vulnerable Shoalwater Bay citizens.

4.188. The Tribe has already invested heavily in and is planning, at significant expense, adaptation and mitigation strategies to address climate change-related impacts to mitigate and/or prevent injuries to itself and its citizens. These efforts include, but are not limited to, planning for and relocating housing for Shoalwater Bay citizens to higher ground, planning for and moving governmental infrastructure and services to higher ground, and planning for the redesign and/or relocation of reservation roads.

V. LEGAL CLAIMS

COUNT ONE
PUBLIC NUISANCE – CH. RCW 7.48

5.1. The Tribe incorporates all the above paragraphs here.

5.2. Under RCW 7.48.120, "[n]uisance consists in unlawfully doing an act, or omitting to perform a duty, which act or omission either annoys, injures or endangers the comfort, repose, health or safety of others, offends decency, or unlawfully interferes with, obstructs or tends to obstruct, or render dangerous for passage, any lake or navigable river, bay, stream, canal or basin, or any public park, square, street or highway; or in any way renders other persons insecure in life, or in the use of property." An actionable nuisance subject to damages and other relief includes "whatever is injurious to health or indecent or offensive to the senses . . . so as to essentially interfere with the comfortable enjoyment of the life and property." *Id.* 7.48.010. "A public nuisance is one which affects equally the rights of an entire community or neighborhood, although the extent of the damage may be unequal." *Id.* 7.48.130.

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5.3. Defendants, individually and in concert with each other, have engaged, and continue to engage in, unlawful, negligent, reckless, knowing, and/or intentional tortious conduct. Such conduct includes:

a. promoting doubt in the public's mind about the existence, causes, and effects of climate change;

b. promoting the sale and use of fossil fuels without warning consumers that using fossil fuels would cause dangerous climate change;

c. promoting the sale and use of fossil fuels that Defendants knew to be hazardous and knew would cause or exacerbate climate change and related consequences, including, but not limited to, sea-level rise, drought, extreme precipitation, and extreme heat;

d. promoting the sale and use of fossil fuels that Defendants knew to be hazardous and knew would cause or exacerbate climate change and related consequences, including, but not limited to, sea-level rise, drought, extreme precipitation events, and extreme heat events;

e. concealing the hazards that Defendants knew would result from the normal use of their fossil fuels by misrepresenting, and casting doubt on, the integrity of scientific information related to climate change;

f. promoting fossil fuels for uses that Defendants knew would be hazardous to consumers, the public, and the Tribe;

g. disseminating and funding the dissemination of information that misleads consumers and the public regarding the known and foreseeable risk of climate change and its consequences, which follow from the normal, intended use of fossil fuels;

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h. misleadingly promoting fossil fuel products as sustainable, clean energy products;

i. misleadingly presenting themselves as clean energy companies who are committed to reducing emissions; and

j. misleadingly promoting their investments in alternative technologies as capable of reducing emissions on a large-scale in the near-term.

5.4. Defendants' tortious conduct has caused harms to public health and property, as well as the ability of the Shoalwater Bay Tribe and its citizens to comfortably enjoy life and property. Defendants' campaign of deception has been pervasive and long-lasting. Their willful campaign has influenced the public's purchasing and investment decisions for decades, driving increased demand for fossil fuels. It has also reduced demand for, and investment in, clean energy, thereby delaying the clean energy transition. This increased demand directly led to increased greenhouse gas emissions and is a substantial factor causing the Tribe's injuries.

5.5. Defendants' conduct is the proximate cause of the Tribe's injuries. Defendants knew that continued fossil fuel consumption would lead to a climate crisis. They nonetheless chose to engage in a sophisticated deception campaign that had the purpose and effect of sustaining, and inflating, fossil fuel consumption. The Tribe's climate injuries are the direct and foreseeable result of Defendants' tortious conduct.

5.6. The Tribe has already suffered substantial injuries, such as damages to infrastructure, governmental services facilities, Tribal residences, and reservation roads due to sea-level rise with attending storm surges and flooding and changes in rainfall patterns resulting in flooding.

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5.7. Defendants' tortious conduct has specially harmed the Tribe, and will continue to do so. The Tribe has had to spend millions of dollars to protect its infrastructure, governmental services facilities, Tribal residences, and reservation roads from sea-level rise, with attending storm surges and flooding, and from changes in rainfall patterns resulting in flooding. Such expenditures will increase in the coming years.

5.8. Defendants' ongoing interference with public rights is substantial and unreasonable. The harm to the Tribe is severe and more than the Tribe should be required to bear without compensation. Defendants' deceptive acts and omissions also lack any social utility because there is no utility in deceiving and misleading the public.

5.9. Defendants' tortious and deceptive conduct described in this Complaint is therefore a proximate cause of an unreasonable and substantial interference with common rights held by the residents of the Shoalwater Bay Reservation, as well as all harms flowing from that public nuisance.

COUNT TWO
WASHINGTON PRODUCT LIABILITY ACT, FAILURE TO WARN – RCW 7.72

5.10. The Tribe incorporates all above paragraphs by reference here.

5.11. Under the Washington Product Liability Act, a defendant manufacturer is liable for failure to warn at the time of manufacture if: (1) defendants' products were not reasonably safe at the time of manufacture because defendants failed to adequately warn of those products' risks; and (2) the failure to adequately warn caused harm. *See* RCW 7.72.030(1)(b). A manufacturer is liable for failing to warn after manufacture when it learns of or should have learned of a danger connected with its product after it was manufactured. In that instance, the manufacturer must provide warnings as a reasonably prudent manufacturer would do under the circumstances and is liable for any

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damages that its failure to warn caused. *See* RCW 7.72.030(1)(c). A product seller other than a manufacturer (including wholesalers, distributors, and retailers) is liable for negligence, including for negligently failing to warn, and for misrepresentions and intentional concealment of information about the product. *See* RCW 7.72.040(1)(a) and (c).

5.12. Defendants' fossil-fuel products were, and are, not reasonably safe because Defendants have failed to warn of the catastrophic risks to the climate from fossil fuel combustion. At the time of manufacture, the likelihood that Defendants' fossil-fuel products would cause catastrophic harm—including sea level rise and more frequent and intense flooding, drought, heat waves, and wildfires—rendered Defendants' failures to warn inadequate. Defendants' concomitant campaign to deceive the public about climate change and the role of fossil fuels in causing it further made warnings necessary.

5.13. Post-manufacture, Defendants acquired increasingly detailed and sophisticated knowledge of the catastrophic effects of unabated fossil fuel use. As a result, these Defendants had a duty to inform and warn users of the risks to the climate of which they had knowledge. Defendants breached this duty by not only failing to warn or inform users of the climate-disruptive effects of continued use of fossil fuels, but also by continuing to deceptively attack climate science and to promote themselves and fossil fuels as environmentally-friendly and sustainable.

5.14. Further, those Defendants acting primarily as wholesalers, distributors and/or retailers of fossil fuel products at all relevant times knew those products would cause catastrophic harm, yet negligently failed to warn of those harms, and misrepresented and/or intentionally concealed the facts about unabated use of those products.

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5.15. Defendants' failures to warn, misrepresentations, and intentional concealments are a proximate cause of heightened fossil fuel consumption, which has directly led to elevated greenhouse gas emissions and, in turn, substantially worsened climate-change effects to the harm and detriment of the Shoalwater Bay Tribe. As a proximate result of Defendants' acts and omissions, the Tribe has incurred, is incurring, and will continue to incur damages to property, public health, and natural resources.

VI. PRAYER FOR RELIEF

Wherefore, the Shoalwater Bay Tribe prays that the Court:

6.1. Adjudge and decree that Defendants have engaged in the conduct complained of herein.

6.2. Order Defendants to abate the nuisance they created, including but not limited to funding an abatement fund to be managed by the Tribe to remediate and adapt its Reservation lands, natural resources, and infrastructure;

6.3. Award joint and several compensatory damages, in an amount determined at trial for injury sustained by the Tribe as a result of Defendants' tortious conduct;

6.4. Award pre-judgment and post-judgment interest, as provided by law;

6.5. Award the Tribe its reasonable costs and attorneys' fees as provided by law; and

6.6. Award any other and further relief the Court deems just and equitable.

VII. REQUEST FOR JURY TRIAL

7.1. The Tribe respectfully requests that all issues presented by the above Complaint be tried by a jury, with the exception of any issues that, by law, must be tried before the Court.

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Dated this 20th day of December, 2023.

Respectfully submitted,

SHER EDLING LLP

/s/ Corrie J. Yackulic
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IN THE SUPERIOR COURT OF THE STATE OF WASHINGTON
FOR THE COUNTY OF KING

SHOALWATER BAY INDIAN TRIBE VS EXXON MOBIL CORPORATION	No. 23-2-25215-2 SEA **CASE INFORMATION COVER SHEET AND AREA DESIGNATION** (CICS)

CAUSE OF ACTION

TTO - Tort /Other

AREA OF DESIGNATION

SEA	Defined as all King County north of Interstate 90 and including all of Interstate 90 right of way, all of the cities of Seattle, Mercer Island, Issaquah, and North Bend, and all of Vashon and Maury Islands.

IN THE SUPERIOR COURT OF THE STATE OF WASHINGTON
FOR THE COUNTY OF KING

SHOALWATER BAY INDIAN TRIBE	No. 23-2-25215-2 SEA
VS	**ORDER SETTING CIVIL CASE SCHEDULE**
EXXON MOBIL CORPORATION	**ASSIGNED JUDGE: Maureen A McKee, Dept. 05** FILED DATE: 12/20/2023 TRIAL DATE:12/23/2024

A civil case has been filed in the King County Superior Court and will be managed by the Case Schedule on Page 3 as ordered by the King County Superior Court Presiding Judge.

I. NOTICES

NOTICE TO PLAINTIFF:
The Plaintiff may serve a copy of this **Order Setting Case Schedule (*Schedule*)** on the Defendant(s) along with the ***Summons and Complaint/Petition.*** Otherwise, the Plaintiff shall serve the *Schedule* on the Defendant(s) within 10 days after the later of: (1) the filing of the ***Summons and Complaint/Petition*** or (2) service of the Defendant's first response to the ***Complaint/Petition***, whether that response is a ***Notice of Appearance***, a response, or a Civil Rule 12 (CR 12) motion. The ***Schedule*** may be served by regular mail, with proof of mailing to be filed promptly in the form required by Civil Rule 5 (CR 5).

NOTICE TO ALL PARTIES:
All attorneys and parties should make themselves familiar with the King County Local Rules [*KCLCR*] -- especially those referred to in this ***Schedule***. In order to comply with the ***Schedule***, it will be necessary for attorneys and parties to pursue their cases vigorously from the day the case is filed. For example, discovery must be undertaken promptly in order to comply with the deadlines for joining additional parties, claims, and defenses, for disclosing possible witnesses [*See KCLCR 26*], and for meeting the discovery cutoff date [*See KCLCR 37(g)*].

You are required to give a copy of these documents to all parties in this case.

I. NOTICES (continued)

CROSSCLAIMS, COUNTERCLAIMS AND THIRD-PARTY COMPLAINTS:
A filing fee of **$240** must be paid when any answer that includes additional claims is filed in an existing case.

KCLCR 4.2(a)(2)
A Confirmation of Joinder, Claims and Defenses or a Statement of Arbitrability must be filed by the deadline in the schedule. The court will review the confirmation of joinder document to determine if a hearing is required. If a Show Cause order is issued, all parties cited in the order must appear before their Chief Civil Judge.

PENDING DUE DATES CANCELED BY FILING PAPERS THAT RESOLVE THE CASE:
When a final decree, judgment, or order of dismissal of all parties and claims is filed with the Superior Court Clerk's Office, and a courtesy copy delivered to the assigned judge, all pending due dates in this *Schedule* are automatically canceled, including the scheduled Trial Date. It is the responsibility of the parties to 1) file such dispositive documents within 45 days of the resolution of the case, and 2) strike any pending motions by notifying the bailiff to the assigned judge.

Parties may also authorize the Superior Court to strike all pending due dates and the Trial Date by filing a *Notice of Settlement* pursuant to KCLCR 41, and forwarding a courtesy copy to the assigned judge. If a final decree, judgment or order of dismissal of all parties and claims is not filed by 45 days after a *Notice of Settlement*, the case may be dismissed with notice.

If you miss your scheduled Trial Date, the Superior Court Clerk is authorized by KCLCR 41(b)(2)(A) to present an *Order of Dismissal*, without notice, for failure to appear at the scheduled Trial Date.

NOTICES OF APPEARANCE OR WITHDRAWAL AND ADDRESS CHANGES:
All parties to this action must keep the court informed of their addresses. When a Notice of Appearance/Withdrawal or Notice of Change of Address is filed with the Superior Court Clerk's Office, parties must provide the assigned judge with a courtesy copy.

ARBITRATION FILING AND TRIAL DE NOVO POST ARBITRATION FEE:
A Statement of Arbitrability must be filed by the deadline on the schedule **if the case is subject to mandatory arbitration** and service of the original complaint and all answers to claims, counterclaims and crossclaims have been filed. If mandatory arbitration is required after the deadline, parties must obtain an order from the assigned judge transferring the case to arbitration. **Any party filing a Statement must pay a $250 arbitration fee**. If a party seeks a trial de novo when an arbitration award is appealed, a fee of $400 and the request for trial de novo must be filed with the Clerk's Office Cashiers.

NOTICE OF NON-COMPLIANCE FEES:
All parties will be assessed a fee authorized by King County Code 4A.630.020 whenever the Superior Court Clerk must send notice of non-compliance of schedule requirements and/or Local Civil Rule 41.

King County Local Rules are available for viewing at www.kingcounty.gov/courts/clerk.

II. CASE SCHEDULE

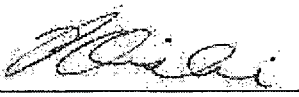
*	CASE EVENT	EVENT DATE
	Case Filed and Schedule Issued.	12/20/2023
*	Last Day for Filing Statement of Arbitrability without a Showing of Good Cause for Late Filing [*See KCLMAR 2.1(a) and Notices on Page 2*]. **$250 arbitration fee must be paid**	05/29/2024
*	**DEADLINE** to file Confirmation of Joinder if not subject to Arbitration [*See KCLCR 4.2(a) and Notices on Page 2*].	05/29/2024
	DEADLINE for Hearing Motions to Change Case Assignment Area [*KCLCR 82(e)*].	06/12/2024
	DEADLINE for Disclosure of Possible Primary Witnesses [*See KCLCR 26(k)*].	07/22/2024
	DEADLINE for Disclosure of Possible Additional Witnesses [*See KCLCR 26(k)*].	09/03/2024
	DEADLINE for Jury Demand [*See KCLCR 38(b)(2)*].	09/16/2024
	DEADLINE for a Change in Trial Date [*See KCLCR 40(e)(2)*].	09/16/2024
	DEADLINE for Discovery Cutoff [*See KCLCR 37(g)*].	11/04/2024
	DEADLINE for Engaging in Alternative Dispute Resolution [*See KCLCR 16(b)*].	11/25/2024
	DEADLINE: Exchange Witness & Exhibit Lists & Documentary Exhibits [*KCLCR 4(j)*].	12/02/2024
*	**DEADLINE** to file Joint Confirmation of Trial Readiness [*See KCLCR 16(a)(1)*]	12/02/2024
	DEADLINE for Hearing Dispositive Pretrial Motions [*See KCLCR 56; CR 56*].	12/09/2024
*	Joint Statement of Evidence [*See KCLCR 4 (k)*]	12/16/2024
	DEADLINE for filing Trial Briefs, Proposed Findings of Fact and Conclusions of Law and Jury Instructions (Do not file proposed Findings of Fact and Conclusions of Law with the Clerk)	12/16/2024
	Trial Date [*See KCLCR 40*].	12/23/2024

*The * indicates a document that must be filed with the Superior Court Clerk's Office by the date shown.*

III. ORDER

Pursuant to King County Local Rule 4 [*KCLCR 4*], IT IS ORDERED that the parties shall comply with the schedule listed above. Penalties, including but not limited to sanctions set forth in Local Rule 4(g) and Rule 37 of the Superior Court Civil Rules, may be imposed for non-compliance. It is FURTHER ORDERED that the party filing this action **must** serve this *Order Setting Civil Case Schedule* and attachment on all other parties.

DATED: 12/20/2023



PRESIDING JUDGE

IV. ORDER ON CIVIL PROCEEDINGS FOR ASSIGNMENT TO JUDGE

READ THIS ORDER BEFORE CONTACTING YOUR ASSIGNED JUDGE.
This case is assigned to the Superior Court Judge whose name appears in the caption of this case schedule. The assigned Superior Court Judge will preside over and manage this case for all pretrial matters.

COMPLEX LITIGATION: If you anticipate an unusually complex or lengthy trial, please notify the assigned court as soon as possible.

APPLICABLE RULES: Except as specifically modified below, all the provisions of King County Local Civil Rules 4 through 26 shall apply to the processing of civil cases before Superior Court Judges. The local civil rules can be found at www.kingcounty.gov/courts/clerk/rules/Civil.

CASE SCHEDULE AND REQUIREMENTS: Deadlines are set by the case schedule, issued pursuant to Local Civil Rule 4.

THE PARTIES ARE RESPONSIBLE FOR KNOWING AND COMPLYING WITH ALL DEADLINES IMPOSED BY THE COURT'S LOCAL CIVIL RULES.

A. Joint Confirmation regarding Trial Readiness Report
No later than twenty one (21) days before the trial date, parties shall complete and file (with a copy to the assigned judge) a joint confirmation report setting forth whether a jury demand has been filed, the expected duration of the trial, whether a settlement conference has been held, and special problems and needs (e.g., interpreters, equipment).

The Joint Confirmation Regarding Trial Readiness form is available at www.kingcounty.gov/courts/scforms. If parties wish to request a CR 16 conference, they must contact the assigned court. Plaintiff's/petitioner's counsel is responsible for contacting the other parties regarding the report.

B. Settlement/Mediation/ADR
a. Forty five (45) days before the trial date, counsel for plaintiff/petitioner shall submit a written settlement demand. Ten (10) days after receiving plaintiff's/petitioner's written demand, counsel for defendant/respondent shall respond (with a counter offer, if appropriate).

b. Twenty eight (28) days before the trial date, a Settlement/Mediation/ADR conference shall have been held. FAILURE TO COMPLY WITH THIS SETTLEMENT CONFERENCE REQUIREMENT MAY RESULT IN SANCTIONS.

C. Trial
Trial is scheduled for 9:00 a.m. on the date on the case schedule or as soon thereafter as convened by the court. The Friday before trial, the parties should access the court's civil standby calendar on the King County Superior Court website www.kingcounty.gov/courts/superiorcourt to confirm the trial judge assignment.

MOTIONS PROCEDURES

A. Noting of Motions

Dispositive Motions: All summary judgment or other dispositive motions will be heard with oral argument before the assigned judge. The moving party must arrange with the hearing judge a date and time for the hearing, consistent with the court rules. Local Civil Rule 7 and Local Civil Rule 56 govern procedures for summary judgment or other motions that dispose of the case in whole or in part. The local civil rules can be found at www.kingcounty.gov/courts/clerk/rules/Civil.

Non-dispositive Motions: These motions, which include discovery motions, will be ruled on by the assigned judge without oral argument, unless otherwise ordered. All such motions must be noted for a date by which the ruling is requested; this date must likewise conform to the applicable notice requirements.

Rather than noting a time of day, the Note for Motion should state "Without Oral Argument." Local Civil Rule 7 governs these motions, which include discovery motions. The local civil rules can be found at www.kingcounty.gov/courts/clerk/rules/Civil.

Motions in Family Law Cases not involving children: Discovery motions to compel, motions in limine, motions relating to trial dates and motions to vacate judgments/dismissals shall be brought before the assigned judge. All other motions should be noted and heard on the Family Law Motions calendar. Local Civil Rule 7 and King County Family Law Local Rules govern these procedures. The local rules can be found at www.kingcounty.gov/courts/clerk/rules.

Emergency Motions: Under the court's local civil rules, emergency motions will usually be allowed only upon entry of an Order Shortening Time. However, some emergency motions may be brought in the Ex Parte and Probate Department as expressly authorized by local rule. In addition, discovery disputes may be addressed by telephone call and without written motion, if the judge approves in advance.

B. Original Documents/Working Copies/ Filing of Documents: All original documents must be filed with the Clerk's Office. Please see information on the Clerk's Office website at www.kingcounty.gov/courts/clerk regarding the requirement outlined in LGR 30 that attorneys must e-file documents in King County Superior Court. The exceptions to the e-filing requirement are also available on the Clerk's Office website. The local rules can be found at www.kingcounty.gov/courts/clerk/rules.

The working copies of all documents in support or opposition must be marked on the upper right corner of the first page with the date of consideration or hearing and the name of the assigned judge. The assigned judge's working copies must be delivered to his/her courtroom or the Judges' mailroom. Working copies of motions to be heard on the Family Law Motions Calendar should be filed with the Family Law Motions Coordinator. Working copies can be submitted through the Clerk's office E-Filing application at www.kingcounty.gov/courts/clerk/documents/eWC.

Service of documents: Pursuant to Local General Rule 30(b)(4)(B), e-filed documents shall be electronically served through the e-Service feature within the Clerk's eFiling application. Pre-registration to accept e-service is required. E-Service generates a record of service document that can be e-filed. Please see the Clerk's office website at www.kingcounty.gov/courts/clerk/documents/efiling regarding E-Service.

Original Proposed Order: Each of the parties must include an original proposed order granting requested relief with the working copy materials submitted on any motion. **Do not file the original of the proposed order with the Clerk of the Court**. Should any party desire a copy of the order as signed and filed by the judge, a pre-addressed, stamped envelope shall accompany the proposed order. The court may distribute orders electronically. Review the judge's website for information: www.kingcounty.gov/courts/SuperiorCourt/judges.

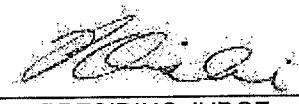
Presentation of Orders for Signature: All orders must be presented to the assigned judge or to the Ex Parte and Probate Department, in accordance with Local Civil Rules 40 and 40.1. Such orders, if presented to the Ex Parte and Probate Department, shall be submitted through the E-Filing/Ex Parte via the Clerk application by the attorney(s) of record. E-filing is not required for self-represented parties (non-attorneys). If the assigned judge is absent, contact the assigned court for further instructions. If another judge enters an order on the case, counsel is responsible for providing the assigned judge with a copy.

Proposed orders finalizing settlement and/or dismissal by agreement of all parties shall be presented to the Ex Parte and Probate Department. Such orders shall be submitted through the E-Filing/Ex Parte via the Clerk application by the attorney(s) of record. E-filing is not required for self-represented parties (non-attorneys). Formal proof in Family Law cases must be scheduled before the assigned judge by contacting the bailiff, or formal proof may be entered in the Ex Parte Department. **If final order and/or formal proof are entered in the Ex Parte and Probate Department, counsel is responsible for providing the assigned judge with a copy.**

C. Form

Pursuant to Local Civil Rule 7(b)(5)(B), the initial motion and opposing memorandum shall not exceed 4,200 words and reply memoranda shall not exceed 1,750 words without authorization of the court. The word count includes all portions of the document, including headings and footnotes, except 1) the caption; 2) table of contents and/or authorities, if any; and 3): the signature block. Over-length memoranda/briefs and motions supported by such memoranda/briefs may be stricken.

IT IS SO ORDERED. FAILURE TO COMPLY WITH THE PROVISIONS OF THIS ORDER MAY RESULT IN DISMISSAL OR OTHER SANCTIONS. PLAINTIFF/PEITITONER SHALL FORWARD A COPY OF THIS ORDER AS SOON AS PRACTICABLE TO ANY PARTY WHO HAS NOT RECEIVED THIS ORDER.



PRESIDING JUDGE

EXHIBIT 2

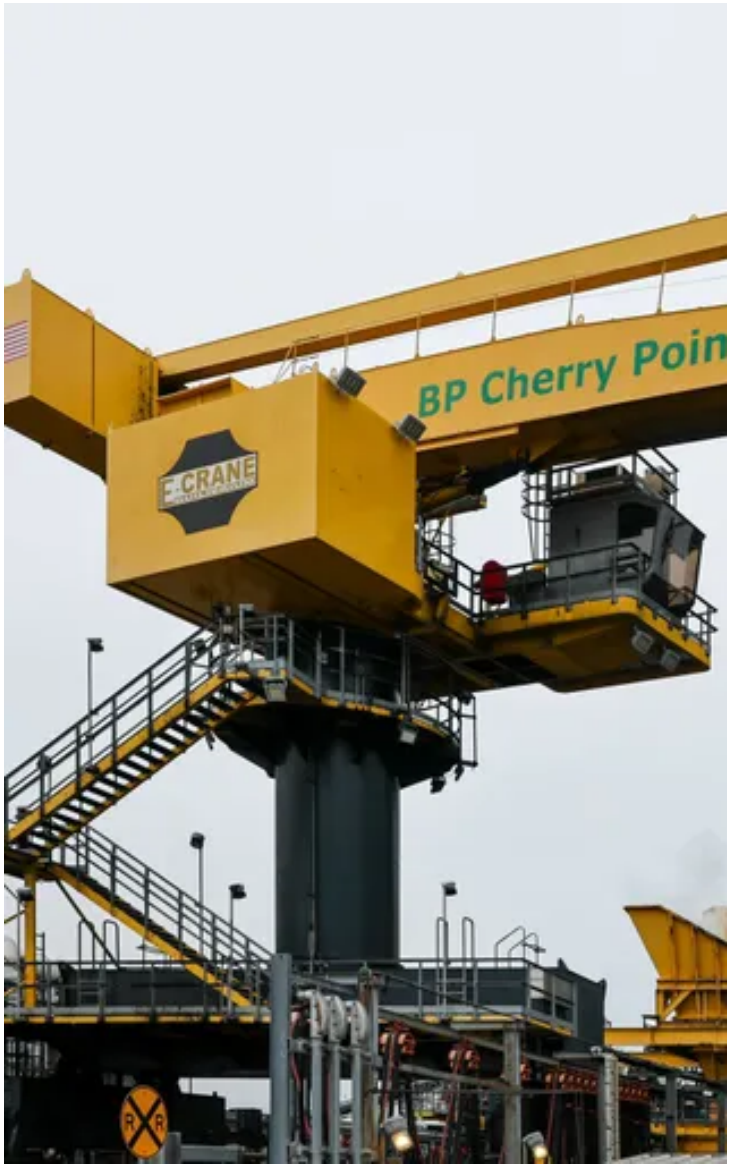
Skip to content

Environment

The Seattle Times

Two PNW tribal nations sue oil companies over costs of climate change

Dec. 21, 2023 at 11:29 am



Cranes load coke for further refining Oct. 19 at Cherry Point Refinery in Blaine. (Kevin Clark / The Seattle Times)

By Isabella Breda

Seattle Times staff reporter

Major oil companies for decades deliberately sought to downplay and discredit scientific warnings about the central role of fossil fuels in causing climate change, alleges two lawsuits filed this week by the Makah and Shoalwater Bay tribes.

The lawsuits filed in King County Superior Court name ExxonMobil, BP, Shell, Chevron, ConocoPhillips and Phillips 66 as defendants, and seek compensation for the millions of dollars already spent, and likely to be spent in the future, for the tribes to respond to climate-induced disasters such as extreme heat, drought, wildfire, shoreline erosion, sea level rise and flooding.

The lawsuits allege the companies have known fossil fuels would cause catastrophic climate change since at least 1959, but continued marketing massive quantities of oil and gas. They allege the oil companies tried to mislead the public by funding op-eds and advertisements in Seattle and national newspapers that claimed the science of climate change was uncertain or lacking evidence.

The Seattle Times reached out to the six companies listed as defendants for comment Thursday morning, but as of late afternoon, only Phillips 66 had responded. A spokesperson declined to comment.

The complaints outline the companies' research and misleading marketing around their products' role in causing climate change and the sea level rise, extreme weather, public health harms and other climate effects on the tribes and their lands.

With both the Makah and Shoalwater Bay reservations on the Pacific Ocean, they are particularly vulnerable to sea level rise, the lawsuits state. Both tribes have already

incurred the costs of moving their citizens to higher ground, and ocean acidification "at an alarming rate" from burning fossil fuels has endangered the tribes' coastal ecosystems and economy, according to the lawsuits.

"We are seeing the effects of the climate crisis on our people, our land, and our resources. The costs and consequences to us are overwhelming," said Makah Tribal Council Chair Timothy J. Greene, Sr. in a statement. "We intend to hold these companies accountable for hiding the truth about climate change and the effects of burning fossil fuels. And we aim to force them to help pay for the high costs of surviving the catastrophe caused by the climate crisis."

The lawsuits also cite a report by the Climate Impacts Group at the University of Washington that suggests with global warming of at least 1.5 degrees Celsius by 2050, Washington is projected to experience a 67% increase in the number of days per year above 90 degrees, relative to 1976-2005, leading to an increased risk of heat-related illness and death, warmer streams and more frequent algal blooms.

The report also found warming would fuel a decrease of 38% in snowpack, relative to 1970-99, leading to reduced water storage, irrigation shortages, and winter and summer recreation losses, as well as increases in winter streamflow, decreases in summer streamflow, leading to reduced summer hydropower, conflicts over water resources and negative effects on salmon.

"These oil companies knew their products were dangerous, yet they did nothing to mitigate those dangers or warn any of us about them, for decades," said Shoalwater Bay Chair Charlene Nelson in a written statement. "Now we are facing hundreds of millions of dollars in costs to relocate our community to higher ground and protect our people, our property, and our heritage. These companies need to be held accountable for that."

The tribes bring their claims under Washington's Products Liability Act for failure to warn, misrepresentation and intentional concealment. The complaints request jury trials, and ask the court to order the companies to create a fund to be managed by the tribes to remediate and adapt reservation lands, natural resources and infrastructure to climate change.

The lawsuits follow the path of more than 20 local and state governments that have sued fossil fuel companies over their role in climate change since 2017, according to E&E News.

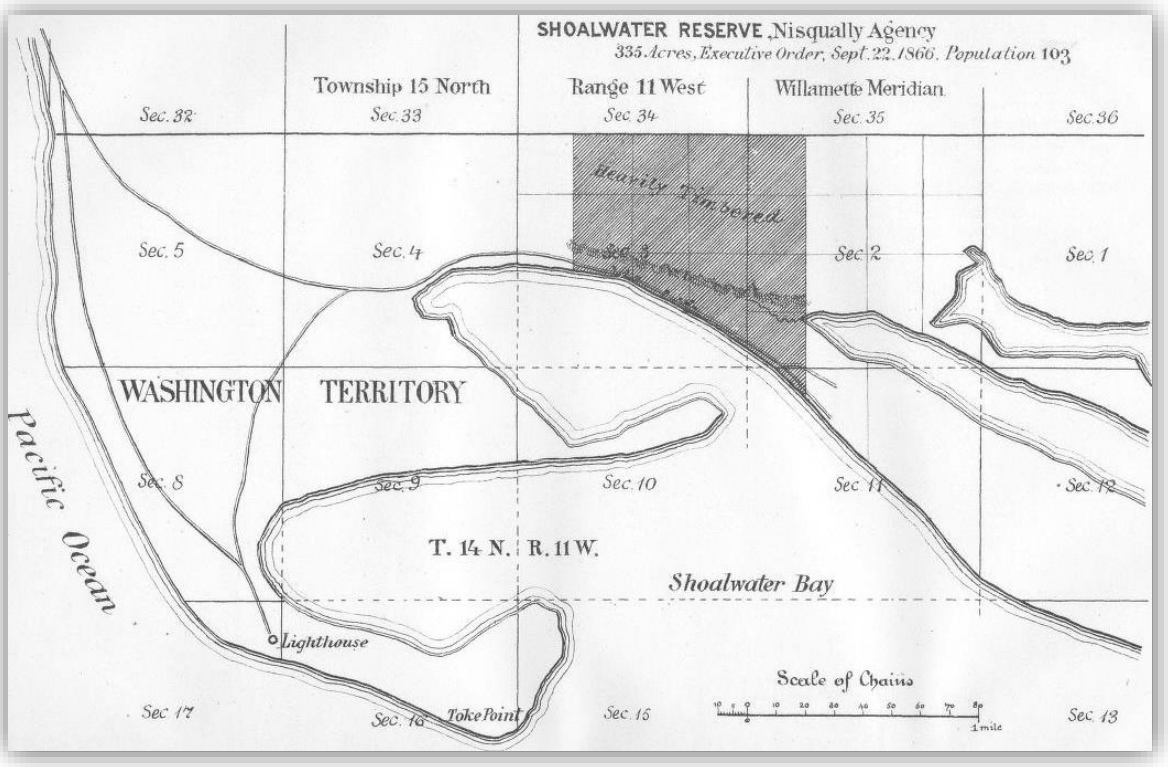
Isabella Breda: *206-652-6536 or ibreda@seattletimes.com; Seattle Times staff reporter Isabella Breda covers the environment.*

View 128 Comments / 128 New

EXHIBIT 3

Shoalwater Bay Tribe
Tribal Hazard Mitigation Plan

Effective March 20, 2020 – March 19, 2025



Shoalwater Reserve, Nisqually Agency, 1879

Courtesy of University of Washington Libraries

Shoalwater Bay Tribal Hazard Mitigation Plan

Effective March 20, 2020 – March 19, 2025

Funded by

Federal Emergency Management Agency

Pre-Disaster Mitigation Program

&

The Shoalwater Bay Indian Tribe

Prepared by

Shoalwater Bay Tribal Council

&

Shoalwater Bay Tribe Office of Emergency Management

Chair: Charlene Nelson

Vice-Chair: Doug Davis

Secretary: Lynn Clark

Treasurer: Joel Blake

Member at Large: Dennis Julnes

Lee Shipman, Director of Emergency Management

Primary Author & Editor:

Glenn B. Coil, Project Consultant

g | b | c

Updated for 2019

With material reviewed and included from previous adopted versions 2009, 2014

Cover photos:

Shoalwater Bay Indian Reservation/North Cove looking southeast from SR 105/Cape Shoalwater

Top: North Cove as it appeared August 17, 2007

Bottom: North Cove as it appeared July 18, 2018

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INTRODUCTION/PURPOSE

Thank you for taking the opportunity to review and use the Shoalwater Tribe's 2019 Hazard Mitigation Plan, its second revision and update since its initial development and adoption in 2008.

The purpose of the Shoalwater Bay Tribal Hazard Mitigation Plan is to guide current and future efforts to effectively and efficiently mitigate natural hazards (including earthquakes, tsunamis, coastal erosion and severe weather) on the Shoalwater Bay Tribe's reservation, properties and other areas of tribal interest that in the long-term, will make the Tribe, and its neighbors, more resilient to the negative effects of natural disasters.

This plan was developed with grants and assistance from the Federal Emergency Management Agency (FEMA), as well as other tribal, federal, state and local resources.

The plan was formally adopted by the Shoalwater Bay Tribal Council on March 18, 2020. The plan was approved by FEMA Region 10 on March 20, 2020.

The effective dates for the Shoalwater Bay Tribal Hazard Mitigation Plan is March 20, 2020 – March 19, 2025.

MITIGATION PLAN REQUIREMENT

The Stafford Act and Title 44 of the Code of Federal Regulations (CFR) require that states, tribes, territories, and local governments develop and adopt FEMA-approved hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance.

Specifically **44 CFR 201.7, Tribal Mitigation Plans**, requires a tribal government applying to FEMA as a grantee must have an approved Tribal Mitigation Plan meeting the requirements of § 201.7 as a condition of receiving non-emergency Stafford Act assistance and FEMA mitigation grants, including:

- Public Assistance Categories C-G (PA C-G)
- Fire Management Assistance Grants (FMAG)
- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)

Emergency assistance provided under 42 U.S.C. 5170a, 5170b, 5173, 5174, 5177, 5179, 5180, 5182, 5183, 5184, 5192 will not be affected.

Mitigation planning grants provided through the PDM program, authorized under section 203 of the Stafford Act, 42 U.S.C. 5133, will also continue to be available.

PLAN UPDATE REQUIREMENTS

44 CFRR 201.7 also requires tribal governments to review and revise their hazard mitigation plan periodically to reflect changes in development, progress in local mitigation efforts, and changes in

priorities, and resubmit it for approval within 5 years in order to continue to be eligible for non-emergency Stafford Act assistance and FEMA mitigation grant funding, with the exception of the Repetitive Flood Claims program.

The 2019 Shoalwater Bay Tribal Hazard Mitigation is a revision and update of the 2014 hazard mitigation plan, which in turn was an update of the initial 2008 plan.

2019 PLAN UPDATE – SUMMARY OF REVIEW AND REVISIONS

Hazard mitigation planning has come a long way since the Shoalwater Bay Tribe developed its Tribal Hazard Mitigation Plan in 2008. A better understanding of tribal communities by the federal government and states has led to better coordination and planning tools utilized by all. Of critical importance was the Sandy Recovery Improvement Act, signed by President Obama in 2013, which amended the Stafford Act in several keys areas in how tribal communities can coordinate federal assistance during and after disaster declarations.

- **The Stafford Act now clearly reflects federally recognized tribal governments' status as sovereign nations,** giving them the same status as states when requesting federal disaster assistance. Prior to being amended, the Stafford Act mandated requests for an emergency or major disaster declaration by the President could only be made by the Governor of the affected state. As a result, federally recognized tribes were statutorily excluded from making a direct request for a Presidential declaration and were required to make a request through the state(s) in which they were geographically located.

- **The Stafford Act now allows consideration of all of a tribe's affected land.** Disasters don't respect borders – their effects can stretch across multiple counties and states, and the impacts can vary widely from community to community. Prior to the amendment of the Stafford Act, the federal and state governments made it hard to meet the needs of impacted tribes, especially when tribal nations cross over one or more state lines. Before the Stafford Act amendment, an affected tribal government would have to submit a request to the governor of each state within which the tribe's lands are located to request an emergency or major disaster declaration.

  In addition, FEMA guidance and assistance, although invaluable and appreciated, was not targeted or focused specially for tribal communities and their needs and customs, and thus could lead to confusion and frustration in regards to FEMA planning and program grant requirements, including tribal mitigation plans. Updates to FEMA policies have help overcome these roadblocks, and greatly improved coordination and assistance.

Changes and improvements in our scientific knowledge and understanding of natural hazards, increased public awareness through the better sharing of information through websites and social media, as well as increased public and government support for mitigation efforts after our nation has experienced unprecedented natural disasters over the last decade, has led the Shoalwater Bay Tribe to refocus on

how to develop its hazard mitigation plan to make it more accessible and useful to the tribal community, its staff and leaders, as well the greater Tokeland area and Pacific County and coastal region.

For this plan update, the tribe and its emergency planning committee, in conjunction with a planning consultant, reviewed and revised the mitigation plan to make the plan more readable and useful, meet revised FEMA tribal planning requirements, as well as updated to reflect changes in development, and tribal priorities. Improved scientific data and modelling, as well as progress on on-going mitigation efforts.

Specifically:

- **FEMA Tribal Mitigation Plan review**

  Effective December 5, 2018, The Tribal Mitigation Plan Review Guide (Guide) is FEMA's updated policy on, and interpretation of, the requirements for Tribal Standard and Enhanced Mitigation Planning. This plan update has been reformatted to align with the Guide for ease of review, accessibility and future updates.

- **Changes in development**

  Since the 2014 plan update, the Tribe has continued to expand its land and property holdings, as well as pursue economic development efforts. This plan will include updates on development, as well future development plans, and will analyze natural hazards, and its effects on these additional developments.

- **Improved data and modelling**

  This plan will incorporate the most recent data and modelling, as well as historic past event data, on natural hazards, as available. This includes:
  - Updates tsunami inundation and velocity models using more precise LIDAR data,
  - Improved earthquake modelling, including subsidence projections,
  - Updated modelling and projections on climate change, and
  - Updated modelling and data on coastal erosion and flooding, including revised FEMA RISK maps.

- **Tribal priorities**

  This plan will document and describe how the tribe reviewed and revised its priorities in regards to past successes, long-term goals, as well as better understanding of risks and vulnerabilities.

- **Progress on tribal mitigation efforts**

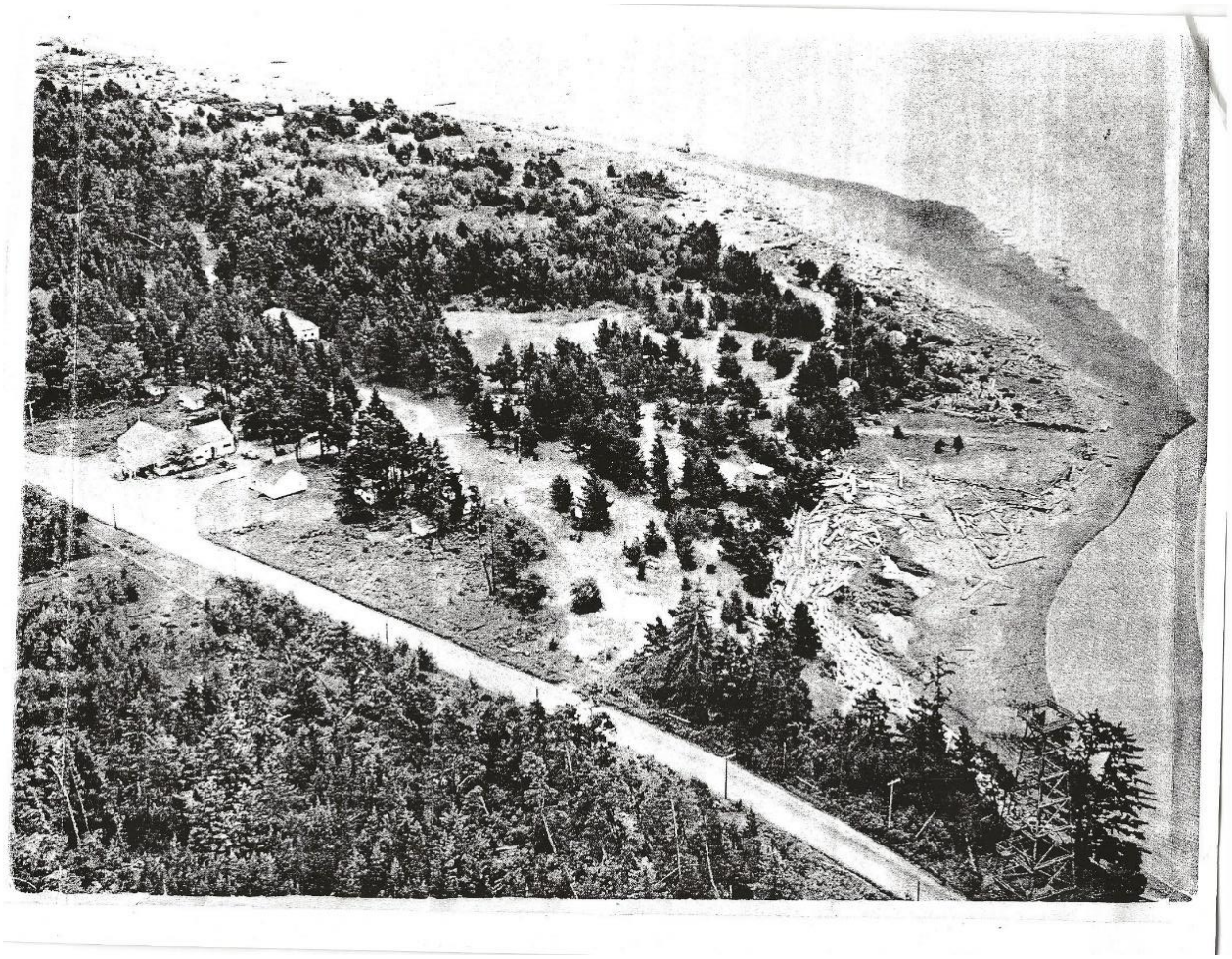
  This update will also document and discuss how the tribe reviewed progress on current mitigation efforts, and revised and prioritized efforts and actions going forward.

- **Streamlined planning document**

  Although intended as a community planning document, mitigation plans have tended to be very long, full of technical and scientific jargon, which have diluted, rather than enhanced, the purposes and goals of a successful mitigation planning effort. The 2008 Shoalwater Bay Hazard Mitigation Plan was 180 pages, and the 2014 plan update was 322 pages!

  Using the FEMA Tribal Planning Guide to ensure that the tribe meets planning requirements, this plan has been streamlined and edited to a more concise document that better clarifies the hazard exposure and vulnerability of the tribal community, as well as document the planning effort to identify, prioritize and implement its mitigation efforts. Detailed and technical information will be included in appendices, as needed, and the previous versions of the hazard mitigation plan will continue to be made available in order to ensure continuity and future review of past planning efforts.

Figure 1: Georgetown in the 1930's. The buildings in the left center is where the current post office is located. Donated by Alice at Georgetown Library, June 13, 2007



2019 PLAN UPDATE – SUMMARY

This section will provide an overview of the FEMA required updates of the Tribe's Hazard Mitigation Plan. During review of the 2014 plan and update process, it was determined that a major update and reformat of the plan would be conducted, utilizing the updated 2018 FEMA Tribal Plan Review Guide, as well as updated hazards data and reports.

CHANGES IN DEVELOPMENT

Since the 2014 Plan update, the Shoalwater Bay has acquired significant acreage of nearby and adjacent parcels to its original Reservation lands. As of 2019, the Shoalwater Bay Reservation, Trust lands and fee lands totaled an area of approximately 3,388 acres. This is significant growth from the 2008 plan, when tribal lands totaled about 845 acres. Although no major structural developments occurred, the Tribe has expanded some facilities, such as the Shoalwater Bay Casino and the tribe's Georgetown Station, and acquired homes in the Dexter-by-the-Sea neighborhood. Properties acquired can be generally categorized as follows:

- **Upland forest and timberlands adjacent to the Tribe Reservation and Trust lands.**
  Also called the Green Diamond/Cedar River Timberlands. Comprised of about 5 sections, or 2,512 acres adjacent to the Reservation on the west, north and east, these lands will be used for the Tribe's future development and relocation into safer higher grounds that are less vulnerable from seismic shaking, sea level rise and flooding from coastal erosion and tsunami. Other uses will be for conservation, recreation, and economic development. As of 2019, Tribe has purchased 208 acres, with agreement to purchase the remaining lands in the next few years.

  One potential hazard concern for these heavily forested and overgrown former logging lands are the increased risk of wildfires due to changing climate. The Tribe has updated its Mitigation strategies and actions to reflect this concern.

- **Intertidal beach and bay lands and wetlands, including oyster beds**.
  Also referred to as the Larsen Purchase (excluding oyster beds). The tribe has acquired these properties to increase its land base, prevent development in hazard and environmentally sensitive areas, and to restore natural habitat. The oyster beds are being considered for economic development purposes.
  Although the impacts of natural hazards to people are structures are minimal in these areas, there is concern for continued coastal erosion, as well as rising sea levels that could damage oyster beds and reduce wetlands and habitat.

- **Residential properties in Dexter-by-the-Sea and Tokeland**
  These structures generally have the same vulnerability to natural hazards as other older tribal structures in the area. Updated hazards data show a reduced risk to flooding, but an increased severity of tsunami inundation and velocity.

BUILDING AND INFRASTRUCTURE CHANGES

For the plan update, the Tribe's GIS database of Tribal buildings was analyzed and updated. A list of the Tribe's insured facilities and equipment, housing, and commercial property (current for 2018-19) was also reviewed.

The updated GIS database indicated 108 structures owned by the tribe and/or on tribal lands. This is similar to the 75 structures identified in the 2014 plan update, as it was noted that additional garages, sheds and other outbuildings were mapped for the 2019 update. Tribal staff also noted that some buildings and sheds may have also been moved or torn down, affecting accurate comparisons.

Table 1: GIS Summary of Tribal Structures, updated, 2019

Tribal facilities and offices, including infrastructure	14
Commercial facilities & related structures	15
Residential structures (single, duplex, manufactured)	48
Storage sheds, garages and similar structures	31
Total	**108**

An analysis of the Tribe's insured structures and equipment can be summarized as follows:

Table 2: Insured Value of Tribal Facilities & Equipment, 2019

Tribal housing	30 structures	$3.6 million, total insured value
Tribal facilities	28 structures, including equipment	$14.78 million, total insured value
Willapa Bay Enterprises (tribal commercial facilities)	20 facilities and equipment	$19 million, total insured value
Total	**78 structures & equipment**	**$37.38 million total insured value**

The 2014 plan update did not include updated estimates of values, and relied on data from the 2008 plan, which estimated about $28 million in insured property.

The differences between the GIS database and the insured value list can be attributed to the presence of uninsured structures, privately insured structures, address discrepancies, as well as methods of compiling the lists.

- The **$37.78 million/ 108 structures** estimate should be considered the total value/count of potential losses from a catastrophic hazard event for this plan update.

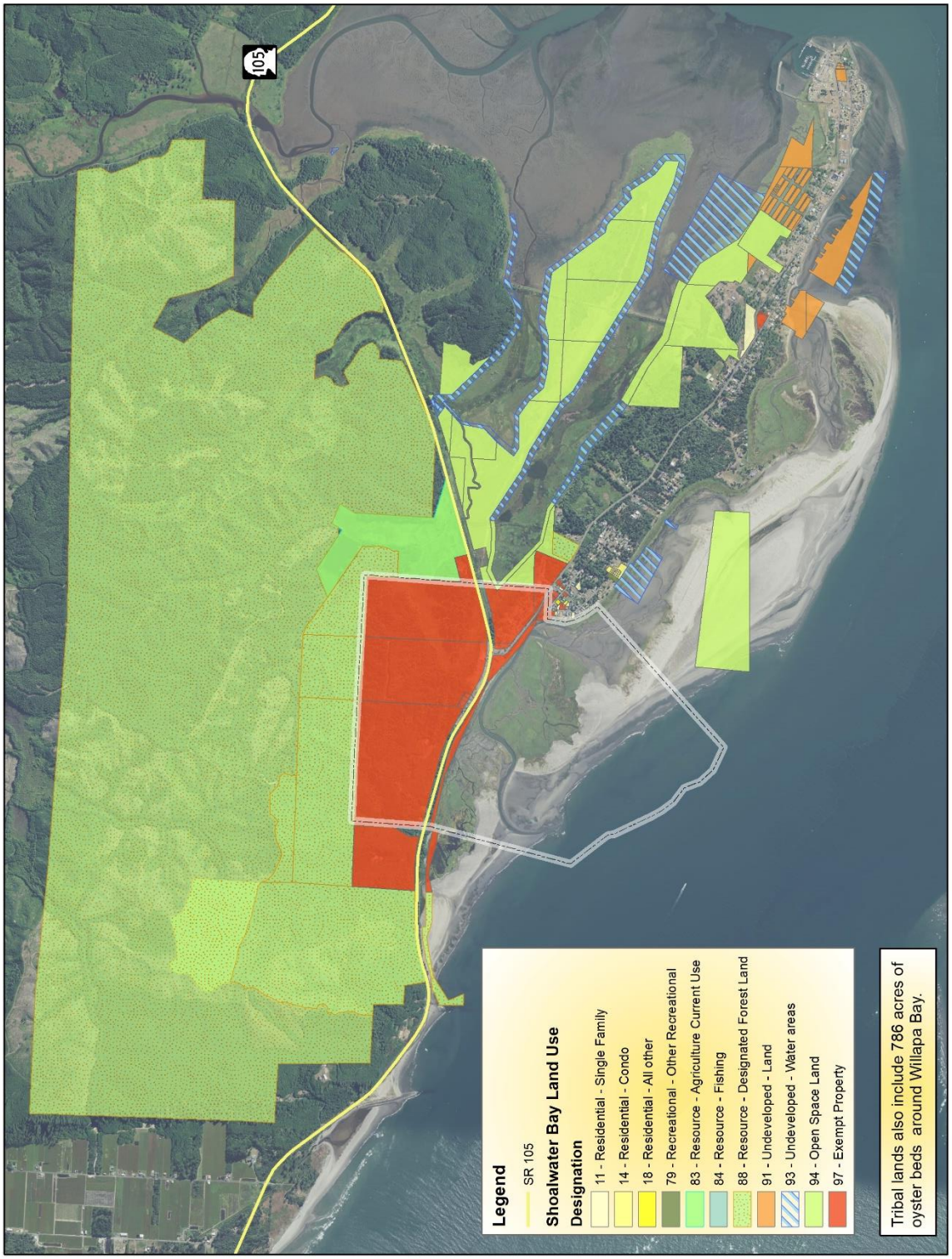


Figure 2: Tribal properties & land use

REVISIONS DUE TO PROGRESS IN TRIBAL MITIGATION EFFORTS

STATUS OF 2014 MITIGATION ACTIONS

The Tribe conducted a comprehensive analysis of the mitigation objectives and actions identified in the 2014 plan update, as well as reviewed the objectives and actions from the initial plan. Many actions in the initial plan were included in the 2014 update. This is noted in the review to better track long-term progress. Comments about each action are included in the review.

Many mitigation actions are on-going or part of a long-term strategy. These were included or revised in the updated mitigation strategy. Mitigation actions completed, or those that were redundant, not feasible, and/or didn't fulfill Tribe's current priorities, were also not included in the update.

The 2014 Plan update included 57 mitigation actions (The original plan included 19 actions). Of these 57 actions:

- 6 actions were completed
- 24 actions are on-going or in process of being completed, and included in the 2019 update
- 27 actions were considered not part of the Tribe's current priorities, redundant, or not feasible, and were removed.

Within these totals:

- 9 actions were carried over from the 2008 plan. Of these:
  - 7 actions are on-going and will be included and/or revise and included in the 2019 update.
  - 2 actions were not needed and removed

Table 3: Status of 2014 Mitigation Actions

2014 Mitigation Actions	progress/status completed on-going remove	in 2008 plan?	comment
S-1—Develop a post-disaster action plan for all hazards of concern that addresses debris management, cultural/historical data gathering, substantial damage assessment, and grant management. This plan would be an appendix to the Tribe's Emergency Management Plan.	ongoing	N	The Tribe completed and updated numerous disaster action plans in 2019. Additional plans will be prepared while updating and improving current plans, as needed.
S-2—Adopt the Shoalwater Bay Tribe Hazard Mitigation Plan as an element of any comprehensive plan that the Tribe will create, in order to ensure linkage between the two documents.	remove	N	Not applicable to current tribal planning priorities, incorporate into related actions.

2014 Mitigation Actions	progress/status completed on-going remove	in 2008 plan?	comment
S-3—Work with NOAA to develop an updated Tsunami model once new FEMA flood maps are adopted.	completed, remove	N	Updated tsunami models released in 2018, used for plan update and other efforts.
S-4—Pursue feasible, cost-effective home elevation or acquisition projects, targeting identified repetitive loss (none currently) or frequently flooded (including nuisance flooding) properties on the Reservation.	remove	N	No longer tribal strategy.
S-5—As climate change will undoubtedly impact water supplies in the future, consider working with local water providers and local jurisdictions to begin developing concepts and regulations regarding water	on-going	N	To better reflect tribal priorities, will be incorporated into related actions on water supply.
S-6—Consider codes and ordinances which positively influence the resiliency of the tribe from the hazards of concern, such as land use development; landscaping ordinance for fire fuel reduction; building codes for minimum seismic stability; flood damage prevention ordinance to cumulatively track substantial improvements and damage, etc.	on-going	Y	This action will be updated to reflect Tribe's current strategy related to implementing a fuel reduction program, and its adoption of federal building codes.
S-7—Considered adopting a regulatory freeboard standard for new construction to elevate homes above flooding.	remove	N	No longer a tribal strategy.
S-8—Consider stream bank and hillside stabilization projects to protect infrastructure, including natural plantings.	on-going	Y	Refocus action on hillside stabilization efforts, as stream bank issues are not relevant to tribal mitigation efforts.
S-9—Secure funding to acquire additional generators to maintain critical infrastructure on reservation, including for water systems, especially for new facilities being constructed or older facilities being renovated that do not already have generators.	on-going	Y	Generators will be only source of power after a hazard event, so the tribe recognizes importance of continuing to acquire generators where needed. Fuel sources for generators will also need to be considered.
S-10—Develop a stormwater management plan as development continues on the Reservation and in relation to the Casino site and new development.	on-going	N	This action will incorporated into a broader tribal storm water management strategy.
S-11—Consider a building setback/spacing requirement for new construction in areas susceptible to wildfire exposure.	on-going	N	Merge with fuel reduction program action.
S-12—Join the Firewise program by adopting the program's policies for managing wildland-urban interface areas on the Reservation.	remove	N	Not applicable to tribal priorities, merge into fuel reduction program action.

2014 Mitigation Actions	progress/status completed on-going remove	in 2008 plan?	comment
S-13—Consider planting standards in wildland buffer areas to include fire-resistant plants with loose branching habits, non-resinous woody material, high moisture content leaves and limited seasonal accumulation of dead vegetation.	on-going	N	Include as part of fuel reduction program include comment on use of native plantings.
S-14— Work with the National Tsunami Hazard Mitigation Program to develop vertical evacuation routes for tsunami hazard.	completed and on-going	N	Tribe awarded FEMA grant in 2018 to develop vertical evacuation tower in Tokeland. Will continue to pursue similar opportunities.
S-15—Consider building codes that would harden new and existing structures from the potential impacts of earthquakes.	remove	N	Redundant to other efforts.
S-16—Conduct seismic vulnerability studies of all infrastructure, including critical facilities...	remove	Y	This has been completed via other efforts; redundant.
S-17—Promote the structural and non-structural seismic retrofit of structures built before 1974 by a targeted outreach to the owners of these structures, including a Reservation-wide tie-down program.	remove	N	No structures applicable for this action, not within tribal scope to regulate/mitigate.
S-18—Continue and enhance where feasible the Tribe's drainage system maintenance program to reduce or minimize the impacts of stormwater flooding on the Reservation.	remove	N	Redundant, merge into stormwater-related actions.
S-19—Work with the Federal and State Departments of Transportation and two surrounding counties to identify landslide-risk areas along major roadways. Promote increased inspections on roadways along and on the Reservation to reduce risk from landslides and washouts. Seek ways to improve slope stability and drainage, and seek funding to plan for and repair future slope failures to reduce the potential for isolation and to provide for additional access to the Reservation.	completed and on-going	N	Reword action to indicate support for local/state efforts outside tribe's jurisdiction, including work done on SR 105.
S-20—Develop a public outreach strategy of ongoing programs providing multiple messages that support all phases of emergency management, including the maintenance of a 7-day supply of food and water. This should include CERT training. Training program should also include an outreach program for elders and sensitive populations to provide assistance as needed.	on-going	N	This continues to be am on-going, long-term effort.
S-21—Prior to new development, conduct a vulnerability assessment of water and wastewater utilities for exposure to all identified hazards of concern.	remove	N	Will be incorporated into other on-going development efforts.

2014 Mitigation Actions	progress/status completed on-going remove	in 2008 plan?	comment
S-22—Review utility designs and standards for safety and competence under natural and human-caused disasters, utilizing information from this hazard mitigation plan. Once vulnerability determined, work with tribal and local providers to site harden utility service.	remove	N	This action is redundant to other efforts.
S-23—Develop a Reservation-wide comprehensive education program to educate tribal members about: hazards of concern on the Reservation, hazard mitigation opportunities, and evacuation routes.	remove	N	Same as S-20, redundant.
S-24— Assess the Tribe's evacuation and primary response routes, and work with Tribal, County and Federal Departments of Transportation to develop alternate routes; develop right of way agreements as necessary, and negotiate removal or unlocking of gates with locks.	on-going	Y	Update as needed to reflect current strategies; discuss improvements to routes esp. those outside of tribal jurisdiction.
S-25 Assess potential debris accumulations along coastline and in water channels, to include debris from the 2011 Japanese tsunami, in an effort to develop recovery and response plans.	remove	N	Debris Mgmt. Plan adopted. Redundant to other efforts. 2011 Japanese Tsunami debris issue no longer relevant.
S-26— Support and participate in State and County efforts for public education programs, as well as self-sustainability campaigns and emergency preparedness.	remove	N	Redundant to similar efforts.
S-27— Update emergency response plans based on the information contained in this plan. Those plans should then be practiced and exercised so community members know the areas of concern and can evacuate appropriately when a disaster occurs.	completed, on-going	N	Plans have been updated in 2019, but require to be updated in future. List plans to be updated within 5 years.
S-28—Develop a protocol and system for capturing damage data on the Reservation for disaster reporting. Consider including flood depth data, dollar losses for all hazards impacting the Reservation, and duration of impact from the event. The data should be used to update the hazard mitigation plan.	completed	N	This action was completed via development of a Disaster Recovery Plan and other supporting plans.
S-29—Conduct LIDAR studies on any newly acquired properties to provide enhanced data for determining vulnerability to hazards of concern. Data acquired should be used to update this hazard mitigation plan as needed.	completed	N	Tribe utilizes LIDAR as it becomes available. Area well covered by multiple studies and data from different years to reflect changing conditions.
S-30— If owners are willing, relocate private and public residences or other facilities that have been repeatedly flooded to areas outside the floodplain through acquisition projects funded by the Hazard Mitigation Grant Program or Flood Mitigation Assistance.	remove	N	No areas of concern, not a tribal priority.

2014 Mitigation Actions	progress/status completed on-going remove	in 2008 plan?	comment
S-31— Continue participation in NOAA's StormReady Program.	on-going	N	In 2019, TsunamiReady & StormReady program renewed for 3 years. Participation will need to be renewed.
S-32— Seismically retrofit water towers and water storage structures to reduce the potential for collapse during an earthquake or significant flood event, and enhance water lines for firefighting. Once completed, the tower can be used to store water for firefighting on the Reservation.	on-going	N	On-going effort to secure funding to implement.
S-33 – Develop Fire Safe Council(s) to assist neighborhoods and communities in become more resilient to the impacts of fire.	completed	N	Tribe became member of regional fire authority, add to Capabilities. This specific action no longer priority.
S-34 Enhance water systems on Reservation to increase capacity of water storage facilities; obtain alternate sources (wells) and increase capacity to enable ability to utilize fire hydrants without damaging existing infrastructure and reducing capacity for residents.	on-going	Y	New fire hydrants added in 2019, add to Capabilities.
S-35 Establish policy which sets forth requirements for identifying and using suction supply water sources in areas without fire hydrants on the Reservation to assist in firefighting abilities. This may include working with outside agencies and federal departments to make certain all environmental requirements are considered. This initiative will include enhancing fire response apparatus capacity to support hauled water operations.	remove	N	Redundant to other efforts.
S-36 Purchase portable water storage tanks equipped with fire suppression supply connections which will be strategically located in areas with high fire danger for use in firefighting.	remove	N	Redundant to other efforts.
S-37 Train residents on use of portable water tanks to assist in firefighting efforts until first responders arrive.	remove	N	Redundant to other efforts.
S-38 Obtain hand tools which can be placed in community centers throughout Reservation which residents can check out to help maintain defensible space around residences, and to maintain areas along roadways.	remove	N	Redundant to other efforts.
S-39 Review potential to purchase a chipper for the Reservation which can be used to reduce fire fuel.	remove	N	Redundant to other efforts.

2014 Mitigation Actions	progress/status completed on-going remove	in 2008 plan?	comment
S-40 Develop policy and plan for litter removal Reservation wide. This will be a multi-year plan which ultimately encompasses the entire Reservation, and includes private residents' participation.	completed	N	2019 - Debris Removal Plan adopted, add to capabilities.
S-41 Seek funding opportunities to assist homeowners in landslide areas to structurally retrofit homes, or for acquisition or relocation of homes currently in high landslide areas to other areas of the Reservation.	remove	N	Not applicable, not a tribal priority related to exposure.
S-42 Work with community members within fire units to determine areas where Shaded Fuel projects would be most beneficial in reducing fire severity. Prioritize projects and establish community events/work projects to focus on specific areas.	remove	N	Combine into "wildfire fuel reduction program" related actions.
S-43 Work with Pacific County to widen (Firewise recommendation ~ 24 feet) and clear bridges and roadways for fuel breaks and evacuation routes. Projects should be prioritized based on local emergency response and fire plans for prioritized evacuation routes.	remove	N	Redundant to other efforts.
S-44 Seek funding opportunities to assist with signage needs for streets for emergency response and evacuation.	remove	N	Redundant to other efforts.
S-45 Work with local Fire Safe Councils to pursue SNAP or NAP grants for low-income residents for defensible space.	remove	N	Not a tribal priority.
S-46 Seek funding opportunities to assist homeowners in home retrofitting projects for projects such as: new roofs, window and siding replacement, netting of eves, aluminum wrapping of structures or other fuel reduction projects; seismic retrofits, flood reduction, and home tie-down projects.	remove	N	Work has been completed for wind storms, additional efforts not tribal priority.
S-47 Complete inventory of known cultural resources located in or near identified hazard areas.	completed and on-going	N	This work has been completed, but further research and assessments are needed.
S-48 Create Access and Functional Needs Working Group to increase community education concerning potential impacts from hazards on special needs population.	completed	N	"Individual Households & Special Needs Assistance Plan" completed
S-49 Install additional early warning and updated communication systems reservation wide, focusing in areas without adequate radio and telephone coverage. This includes mechanisms to address interoperability issues with Pacific County.	on-going	Y	On-going effort. Update action to reflect need for Verizon cell tower. Additional capability: tribal mobile command center, NOAA/Coast Guard radio tower on Reservation.

2014 Mitigation Actions	progress/status completed on-going remove	in 2008 plan?	comment
S-50 Establish additional shelter capabilities which include generators due to lack of electrical infrastructure on much of the Reservation. These shelter locations which include, at a minimum, kitchen, shower facilities, and heating systems, and should meet the access and functional needs of all individuals.	on-going	N	Add need for tornado shelter/safe-rooms.
S-51 Work with Army Core of Engineers to conduct additional assessment work on erosion issue to make certain issue has not progressed.	on-going	Y	Update action to reflect need for on-going maintenance and improvements to coastal protection projects.
S-52 Seek grant funding to obtain additional NOAA weather radios for each facility and resident on the Reservation. This will provide advanced notice of approaching storms, tsunami evacuation and wildfire danger.	remove	Y	Funding for this specific action not needed.
S-53 Seek grant funding to construct a public safety facility to include a police and fire station, court house, meeting facility and EOC on the Reservation, and acquire personnel and equipment that can also accommodate the expansion to include wildland fire services on the Reservation.	on-going	N	Update to discuss on-going priority and need.
S-54 Fund a wildland engine crew, supervisors and equipment to assist in firefighting capabilities.	remove	N	Redundant to other efforts.
S-55 Seek grant funding to purchase two new fire trucks and a water tender to help with firefighting capabilities on the Reservation, as well as surrounding communities.	on-going	N	Update to include current priority of securing grant funding for Fire Safety Trailer.
S-56 Work with local utility service providers to install underground utility lines (power, phone, internet) to minimize disruption of service throughout Reservation.	on-going	N	Update to reflect on-going need. Note that some work is being done in surrounding areas outside of Tribal lands.
S-57 Pursue grant and other funding opportunities to assist communities in becoming more resilient to the impacts of hazards through educational public outreach on defensible space.	remove	N	Redundant to other efforts.

INCORPORATION INTO OTHER PLANNING MECHANISMS

The 2014 Hazard mitigation plan was incorporated into other tribal planning processes to the best extent possible. Much of the Tribe's on-going governance, management and planning is done with a keen understanding of the impacts severe storms, coastal erosion, and earthquakes/tsunami can have on the community. The mitigation plan helps guide land acquisition and development, as well informs

the Tribe's emergency planning documents. This will continue to be so for the 2019 plan update as the tribe continues to refine and develop its planning processes.

REVISIONS DUE TO UPDATES IN TRIBAL PRIORITIES

The Tribe conducted a comprehensive and objective review of its priorities during the community planning process. Emerging from this process, the Tribe's changes in priorities can be summarized as:

- Focus on relocating future development outside of high hazard zones, namely into the hillsides, which have less seismic impacts and are outside of tsunami inundation areas.
- Building evacuation facilities closer to housing and tribal offices/businesses for those that cannot quickly relocate to safe zones. Although included in the previous mitigation plan, this became a higher priority due to the availability of grant funding and political will and support to build a tsunami evacuation tower. After 3 tornado warnings in 2019, the tribe also wants to prioritize the construction of an evacuation shelter/saferoom for severe weather, such as tornadoes.
- Less focus on retrofitting and hardening of existing facilities and homes, many of which are older and nearing obsolescence. With limited resources available, and limited return-on-investment, the tribe has chosen to prioritize investment in its future developments outside of high hazard areas and with construction/development standards that can successfully withstand hazard impacts from severe weather, seismic shaking and wildfire.

These changed priorities, as well as continued priorities, are reflected in the Tribe's updated Mitigation strategies and actions.

PLANNING PROCESS

This section will discuss the planning process used to update the Shoalwater Bay Tribal Hazard Mitigation Plan.

2019 PLAN UPDATE

For this update, the Tribe employed a less formal planning process than was utilized in the 2014 update. Due to staff, time, and resource constraints, the Tribe chose to combine the mitigation planning and meeting process into its standing emergency planning committee schedule, which generally meets weekly to monthly, based on agenda and issues at hand.

The Tribe determined early on in the planning process what it wanted the consultant to focus on for the update, and to prioritize the public awareness and public comments aspect of the planning process. The main driver of this approach was the award by FEMA in June 2018 of a PDM project grant to build a tsunami vertical evacuation tower. The Tribe's limited staff, especially the Emergency Management Dept. and the Emergency Planning Committee, would be focused on this project during the plan update process.

Nonetheless, the Tribe determined that the tower project would generate massive national interest, and thus was an invaluable opportunity to integrate the hazard mitigation planning and public awareness effort into the public relations and awareness campaign for the tsunami evacuation tower.

DOCUMENTATION OF THE PLANNING PROCESS

The Tribe's 2014 Hazard Mitigation Plan will expire in September 2019, so in order to be compliant with FEMA grant requirements, to update the plan with the most current knowledge on hazard vulnerability, and evaluate on-going mitigation activities, the Tribe decided to update its Hazard Mitigation Plan as part of the 5-year plan maintenance cycle. The Tribe applied for a FEMA PDM planning grant in order to hire a consultant to assist with hazard analysis, and drafting the plan to be compliant with FEMA requirements.

PLANNING PROCESS

In March 2018, the Tribe submitted a Request-for-Proposal to hire a consultant. The Tribe assembled a team to review proposals based on qualifications, budget and work plan that met the Tribe's needs for the update.

During the RFP process, the Tribe, led by the Dept. of Emergency Management, and with guidance from Tribal Council, prioritized the following for the plan update:

- To revise the format of the plan to meet the format and updated requirements of Tribal Hazard Mitigation Plans, as outlined the FEMA's newly adopted Tribal Mitigation Plan Review guide[1]. The guide was available in draft, with an effective date of December 5, 2018. It was also hoped, that by utilizing the updated Tribal Guidance, the Plan would be more accessible to the public, including tribal staff, tribal members, as well as local community and other partners.

- To integrate the planning update process into broader public awareness efforts. This became even more important after the Tribe was awarded FEMA grant in June 2018 to build a tsunami vertical evacuation tower.

- Update the risk assessment to include most recent analysis of exposure and vulnerability. Of focus was including updated tsunami inundation and velocity maps, as well as updated FEMA flood hazard data, which was not available during the previous update. More discussion of coastal erosion and climate change would also be included.

- Apart from the yearly review process, a more detailed evaluation of the Tribe's priorities, as well as a detailed review and update of the Tribe's mitigation actions.

PROJECT TIMELINE

In **April 2018**, Glenn B. Coil, who drafted the Tribe's initial plan, and has over 15 years' experience drafting Tribal Hazard Mitigation Plans, was selected as the contractor to update the Plan. Glenn advocates a more informal planning process that focuses on the tribal community's needs and capabilities, while also respecting tribal staff capacity and cultural sensitivities.

May 2018 – contract with consultant finalized, with work to begin end of May. The Tribe, via the EM Director and contractor, discussed the work plan and determined that the usual phased approach to mitigation planning (organize> risk assessment> public process> plan draft> plan review/adoption) would be combined and run concurrently. This approach was determined to be more efficient, as it would allow engagement of the public earlier, so as to not miss important opportunities, such as the annual Yellow Brick Road event in July. Also, the tribe was aware of updated vulnerability and hazards data, so did not need to wait for this to be drafted into maps and text in order to evaluate its priorities and mitigation actions. Generally the plan was to complete a draft in spring 2019, with final adoption and FEMA approval by late summer/fall 2019. Instead, due to staff focus on the vertical tsunami evacuation tower, the draft was completed in December 2019, which review, comments and adoption occurring in winter 2020.

Also discussed at this time:

[1] https://www.fema.gov/media-library/assets/documents/18355

- Initial planning team for this effort. This is composed of key tribal staff and council. It would consist of its standing Emergency planning Committee, with potential to add tribal staff, tribal members or local community members as needed.
- Discussion of outreach to outside partners, such as WA EMD, FEMA, Pacific County, Grays Harbor County, University of Washington
- Brief highlight of past mitigation accomplishments and future efforts.
- Risk assessment – include in update more information on climate change, chemical hazards, and wildfires. It was noted that wildfires have seemed to increase.

June 2018 – FEMA announces $2.5 million grant for Tribe to build a vertical tsunami evacuation tower in Tokeland. Because of anticipated national attention on this project, it was determined that the hazard mitigation plan update could be tied into outreach and public awareness efforts related to the tower. Vertical tsunami evacuation was included in the 2014 plan, thus fulfilling a mitigation action, and presents an example of the importance of hazard mitigation planning.

July 2018 – EM Director and consultant discussed mitigation efforts and accomplishments

July 18, 2018 – Shoalwater Bay Tribe Annual Yellow Brick Event. This annual community event brings in tribal staff and members, local community members, as well as local tribes and local, regional, state and federal partners to showcase and build awareness for the tribes' hazard mitigation, public safety and emergency preparedness efforts. The highlight of the event is an approx. one mile walk from the Tribe's gym to its tsunami evacuation area and emergency shelter on Eagle Hill Road. The purpose is drill the community on the location and evacuation time needed to get to safety in the event of a potential tsunami. The vent was also used to build awareness for the tsunami evacuation tower, as well as thank FEMA, WA EMD and other partners for their assistance in helping develop the grant for the tower. Media was on hand to report of this event and the tower. Consultant was also on hand to discuss the mitigation plan update and process.

Summer/Fall 2018 – Consultant begin process to reach out to subject matter experts to update information on hazards, including tsunami, coastal erosion and climate change. Emergency Planning Committee continues to meet and discuss issues and review mitigation actions, as well as manage development of the vertical evacuation tower.

October 17, 2018 – presentation at University of Washington, College of Architecture & Urban Planning-advanced urban planning studio "Community Engagement for Coastal Resilience". Topic – " Hazard mitigation and resiliency planning in tribal and rural communities". As part of the collaboration effort between UW and Shoalwater Bay Tribe, the consultant gave a presentation at UW providing students insights on the challenges the Tribe's face in regards to hazard mitigation, as well as ideas and lessons on long-term resiliency. The consultant also focused on the importance of economic development and tribal sovereignty as a key driver of resiliency.

Winter 2019 – Begin drafting of plan

Summer 2019 – July 23, Yellow Brick Road event. Survey was conducted, and maps and materials from draft plan, such as updated tsunami hazard maps were presented and discussed with staff, tribal members and local residents.

August 22, 2019 – Consultant made site visit to discuss finalization of updated mitigation actions, results of community survey. Consultant also met with staff and tribal council to discuss future development and plans.

Fall 2019 – Final draft prepared

January 2020 – Plan submitted to Tribe for review and public comment. Plan submitted to FEMA for pre-approval

February 2020 – FEMA pre-adoption approval

March 18, 2020 – Tribal Council adoption of Plan

March 20, 2020 – Approval of plan by FEMA, effective March 2020 through March 19, 2025.

PLANNING TEAM

For this plan update, the tribe did not create a separate committee to oversee the planning process. Instead the tribe used its standing **Emergency Planning Committee** as the lead on the mitigation plan. The committee oversees the on-going implementation of the hazard mitigation plan, and thus the tribe determined that the best use of limited staff, resources, and time was to include the hazard mitigation plan update into its on-going committee processes.

This committee also serves as the tsunami evacuation tower development committee. This process better integrates and coordinates planning and development processes.

Members of the Emergency Planning Committee are listed below. . The tribe had staff turnover during the planning process and in some cases multiple staff members in each respective role on the planning committee. Names listed were committee members as of August 2019.

Table 4: Emergency Planning Committee – August 2019

Title, Department	name
Director, Emergency Mgmt	Lee Shipman
Member, Tribal Council	multiple
Police Chief, Tribal Public Safety	Jim Bergstrom
Director, Information Technology	Jim Schaeffer
Director, Natural Resources	Larissa Pfleeger-Ritzman
Coordinator, Cultural/Heritage	Earl Davis

PUBLIC COMMENT OPPORTUNITIES

The Shoalwater Bay Tribe defines "public" as its Tribal Membership, Tribal Government and employees, the surrounding local communities and districts as well as County, State and Federal agencies and relevant non-government organizations. The Tribe maintains final authority on decision making related to this Plan.

The Shoalwater Bay Tribe is committed to having the public involved and committed to the hazard mitigation planning process. The tribe works closely and coordinates with its neighbors, and welcomes the expertise of state and federal agencies and their staff to help identify projects and funding as well as provide feedback and technical assistance in its mitigation efforts.

The following sections describe the public involvement efforts the tribe employed for the plan update.

EMERGENCY PLANNING COMMITTEE

The tribe's emergency planning committee is composed of the Emergency Management Director and key tribal staff that meets weekly to monthly, depending on need. Additional staff may be brought on or attend meetings as needed to conduct its work. This group oversees the mitigation implementation process, as well as the plan update process. The committee is able to provide input and feedback on the plan based on their department focus.

TRIBAL COUNCIL MEETINGS

The Emergency Management Director updates the Tribal Council at least monthly. This includes updates on the hazard mitigation plan. There is opportunity to discuss the plan, and provide input and feedback. The council will also adopt the plan after final review.

STAFF/AGENCY MEETINGS AND FEEDBACK

The EM Director and the consultant meet with tribal staff and community members as needed to discuss the mitigation plan and provide feedback. This includes in-person meetings, community events, phone/e-mail conversations, and site visits. The EM Director and consultant also reached out to outside agencies for feedback, ideas, data and technical assistance on the plan.

DRAFT REVIEW

A draft of the plan was made available to the community via the tribe's website, as well as notification via staff email and the tribe's newsletter. Feedback, comments and edits were collected and reviewed prior to final draft and tribal adoption and FEMA approval.

COMMUNITY EVENTS

Community events are the best method to involve the public in the mitigation planning effort. It helps show how mitigation planning ties into the tribe's overall emergency management and public safety efforts. It provides the best opportunity to meet with local community and tribal members, many of

who are also tribal staff. These events also include outside partners and agencies, and provides a great opportunity for coordination and feedback.

YELLOW BRICK ROAD

This the Tribe's annual Tsunami Evacuation/ Health Walk, usually held in July. Tribal staff, membership, and the surrounding community are invited to participate. The one mile walk follows the tsunami evacuation route from the tribal gym along Tokeland Rd to SR 105 and up Eagle Hill Road to the 55 foot elevation safe zone area and evacuation shelter. Along the way, booths and tables are set up with participating agencies providing information on emergency management and health. Afterwards, everyone meets back at the gym for lunch and public speakers. The mitigation plan update was included as part of the event for 2018 and 2019.

YBR – JULY 18, 2018

The main highlight of this year's walk was to unveil and celebrate the awarding of a FEMA grant to build a tsunami evacuation tower on Tokeland Point. The consultant was on hand with a booth presenting information on the plan update, as well as to discuss the process of updating the plan. Feedback and discussion was encouraged. A community survey related to hazard mitigation was available in paper and online format for participants.

Figure 3: Plan Update flyer

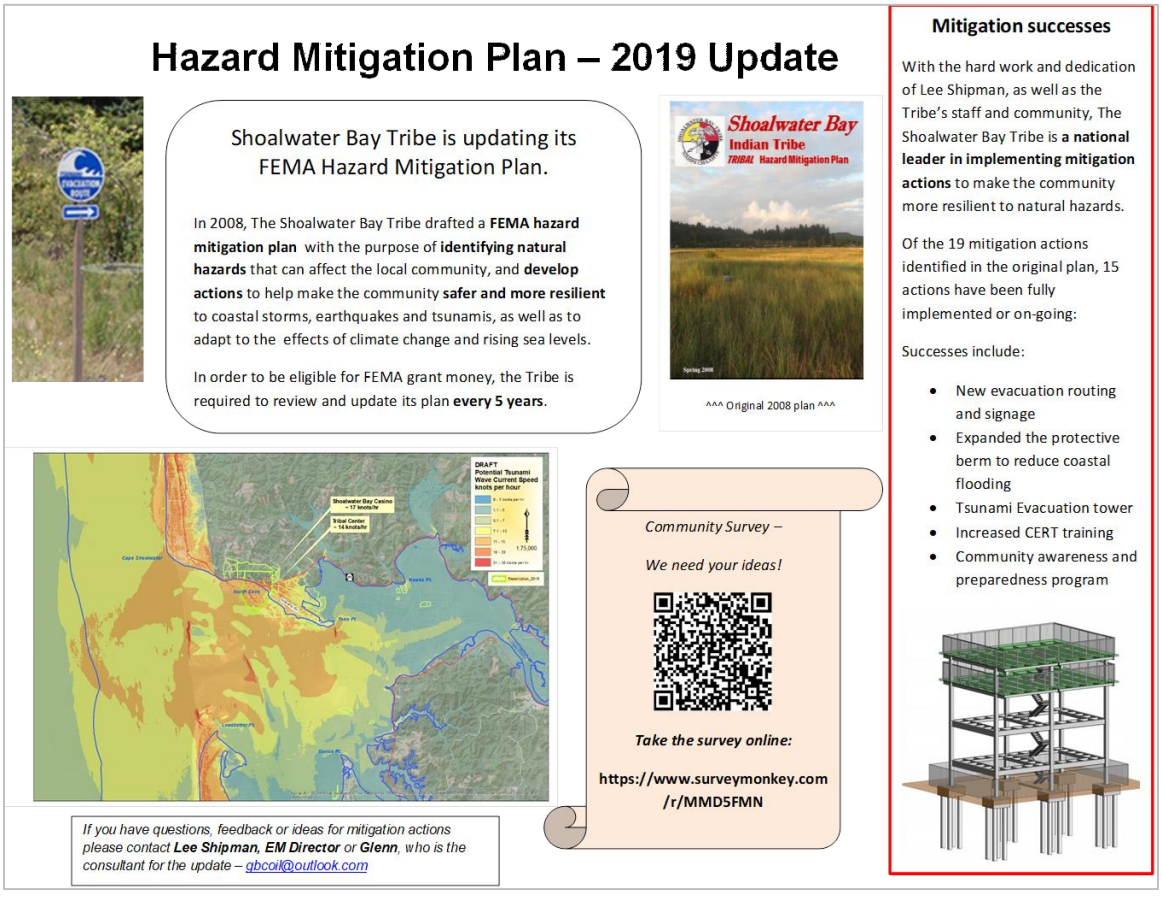


Figure 4: Plan update table

Figure 5: 2018 Yellow Brick Road event

YELLOW BRICK ROAD EVENT – JULY 23, 2019

This year, the consultant was located at the end of the walk, at the 55 foot elevation tsunami evacuation zone. The mitigation plan was tied into the walk, with a discussion of the tribe's mitigation efforts, as well as updated hazard maps, such as tsunami inundation and velocity. The community survey developed for the plan update was available, with most participants who completed the walk responding. There was also great discussions and feedback with local tribal and community members.

Figure 6: View from Eagle Hill Rd. from shelter

Figure 7: Mitigation Plan information table

Figure 8: National Geographic producers interviewing tribal members after tsunami health walk, 2019

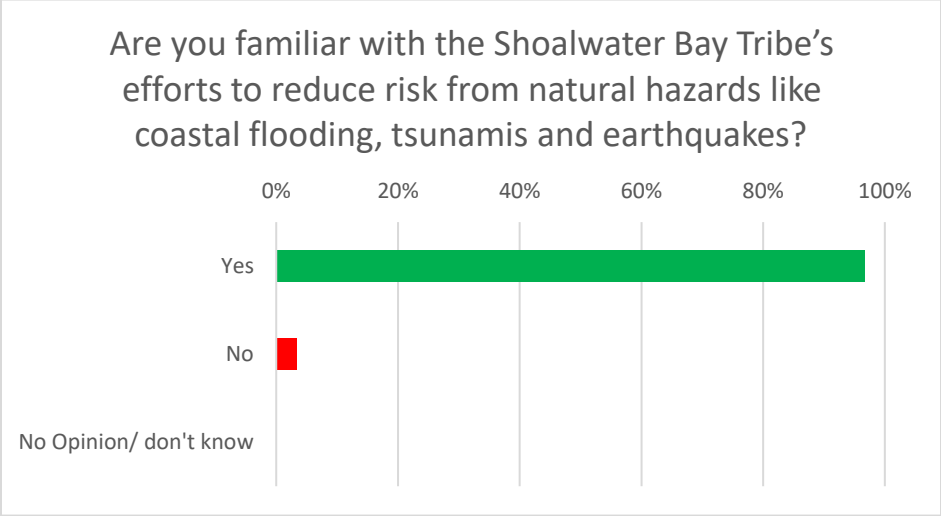
COMMUNITY SURVEY

A survey was prepared to solicit feedback and ideas on the tribe's mitigation efforts and input for the update. Compared to previous survey efforts, It was streamlined into five questions that was determined to measure the tribe's current mitigation and preparedness efforts, as well provide opportunity for ideas and priorities. It was created using an online tool, Survey Monkey[2], with paper copies available. Ideally response could have been better, but response was great during the 2019 Yellow Brick Event. The survey was made available in July 2018, with responses summarized as of August 2019.

For ease of use and convenience to survey takers, the survey was limited to five questions. The results are summarized below. Questions 4 and 5 responses are summarized as word clouds. Please note that raw responses were summarized and edited to provide clarity to issues and concerns noted in survey responses.

SURVEY RESULTS

Figure 9: Survey Question 1 Responses



[2] Survey available at - https://www.surveymonkey.com/r/MMD5FMN

Figure 10: Survey Question 2 Responses

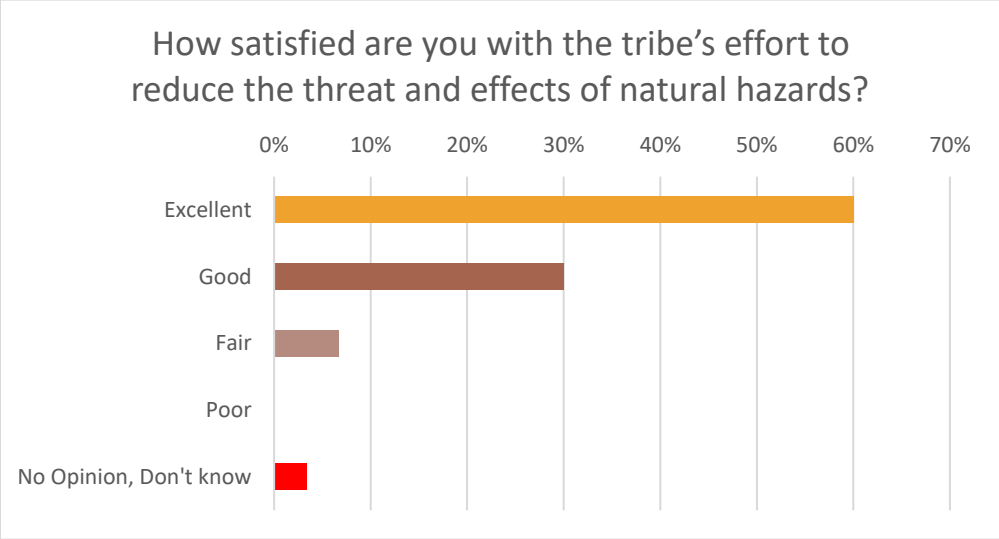
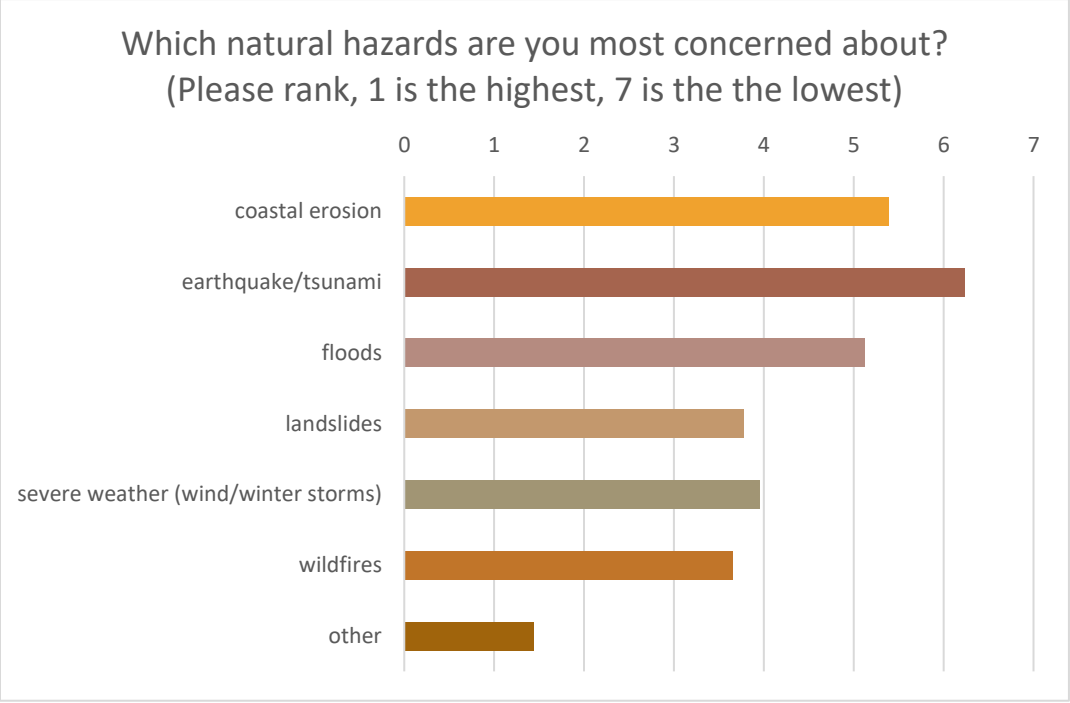


Figure 11: Survey Question 3 Responses



Survey Question 4: In the event of a major disaster, such as a tsunami or earthquake, what community assets are you most concerned about getting destroyed or damaged?

Figure 12: Survey Question 4 Responses

Survey Question 5: Please provide some ideas and suggestions on what further actions the tribe can do to make the Shoalwater Bay community safer and more resilient to the effects of natural disasters.

Figure 13: Survey Question 5 Responses

DOCUMENT PUBLIC INVOLVEMENT

PLAN PARTICIPANTS AND PUBLIC INVOLVEMENT PROCESS

Every effort was made to include all of the Shoalwater Bay Tribe's departments, employees, tribal members and residents of the Reservation as well as the local community in the planning process. . It should be noted that the Shoalwater Bay Indian Tribe is very small, and many of the tribal members who live on the Reservation also work for the Tribe.

Community events, such as the Annual Yellow Brick Road were set-up to include presentations on the plan, as well as provide opportunity for staff and community members to discuss hazards facing the community and current and potential mitigation efforts as. Meetings were also held individually with Tribal departments and staff as necessary. Tribe and consultant also reached out to local partners and agencies for feedback and technical assistance and data. An online community survey was prepared to allow individual feedback. A draft of the plan was made available for public comment and feedback, while the final plan will be made available on the Tribe's website.

Participating tribal departments and groups include:

- Shoalwater Bay Tribal Council
- Tribal Administration
- Emergency Management (project lead)
- Education Program
  - Cultural/Heritage
- Natural Resources Department
- Housing Department
- Wellness Center
- Tribal Library
- Human Resources
- Willapa Bay Enterprises
- Shoalwater Bay Casino
- Tribal Law Enforcement
- Information Technology Dept.

Other agencies involved include:

- Federal Emergency Management Agency (FEMA)
- U.S. Army Corps of Engineers
  - Technical assistance
- WA State Emergency Mgmt. Division
  - Technical assistance and review
- Pacific County
- Pacific County Emergency Management
- Pacific County Sheriff's Office
- Town of Tokeland
- Community of North Cove
- Pacific County Fire District #5
- WA Dept. of Ecology
  - Assistant and data on North Cove coastal erosion
- WA Dept. of Natural Resources – WA Geological Survey
  - Technical assistance ad data on tsunami hazard modelling
- University of WA – College of Architecture and Urban Planning
  - Autumn 2018 URBDP 508B Advanced Urban Planning Studio: Community Engagement for Coastal Resilience

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REVIEW AND INCORPORATION OF EXISTING PLANS, STUDIES AND REPORTS

The Shoalwater Tribe has made a deliberate effort to review and incorporate existing plans, studies and reports into the Tribal Hazard Mitigation Plan update. Ideally, this review will synthesize and tailor this collective knowledge to the specific Shoalwater Bay Indian community. In turn, this plan will fit into an integrated and regional approach to disaster planning that leverages the capabilities of all the tribal, state and local partners.

2019 UPDATE

There have been many developments since the 2014 hazard mitigation plan update, and thus it was imperative to review and incorporate any new plans, studies and reports that have been developed since the last update. FEMA tribal mitigation plan requirements have changed, older report and data may no longer be accessible, and new hazard data and studies have been released that need to be analyzed and included in the plan.

The following section will describe the major plans, studies, reports as well as additional sources that were reviewed and incorporated into this update. Also note that additional sources and reports incorporated are referenced by footnotes.

BACKGROUND/HISTORIC SOURCES

- Shoalwater Bay Tribal website - https://www.shoalwaterbay-nsn.gov/
- Pacific County Historical Society - http://pacificcohistory.org/
- Lower Chinook ethnographic notes – Verne F. Ray, 1938 https://digitalcollections.lib.washington.edu/digital/collection/lctext/id/8657
- Shoalwater Bay Tribal Library

FEDERAL RESOURCES

- FEMA – Tribal Mitigation Plan review guide – 2018 https://www.fema.gov/media-library/assets/documents/18355
- FEMA website was also reviewed for NFIP status, disaster declarations and grant/program resources.
- US Army Corps of Engineers – numerous studies were reviewed regarding the study, development and upgrading of the protective berm along the Tribe's shoreline. The Corps also provided an assessment in 2018 on Eagle Hill Rd, the existing water tank and the multi-purpose shelter.
    - Shoalwater Bay Erosion and Ecosystem Restoration: https://www.nws.usace.army.mil/Missions/Civil-Works/Programs-and-Projects/Projects/Shoalwater/

- FEMA Risk MAP Study for Pacific County… including Shoalwater Bay Tribe – July 2015: https://fortress.wa.gov/ecy/gisresources/SEA/RiskMAP/Pacific/Pacific_Project_Docs/Pacific_RiskReport_Final.pdf

TRIBAL

Although much of the plan update was rewritten to follow FEMA planning guidance and to make more readable, the 2008 and 2014 Shoalwater Bay Tribal Mitigation Plans were used and referenced extensively for this plan. The consultant for the 2008 plan was used for this update, and was able to review and incorporate earlier research as applicable. The Tribe also updated and incorporated new GIS data and reports about tribal properties and structures, as well as development plans.

In addition, other tribal hazard mitigation plans for Northwest Coastal Tribes were reviewed for best practices, where available.

HAZARD DATA AND RESEARCH

Improved and updated hazard data and research was available for this update and was incorporated to fullest extent possible. This included updates to tsunami modeling and inundation, and better understanding of earthquake vulnerability, climate change and coastal erosion.

Sources include:

- WA Dept. of Natural Resources – tsunami hazard maps and models - https://www.dnr.wa.gov/programs-and-services/geology/geologic-hazards/Tsunamis

  A new study was released in 2018 for the southwest Washington coast, including Shoalwater Bay, showing updated tsunami inundation and velocity. This was incorporated into the risk assessment and mitigation strategy.

- WA Dept. of Ecology – Flood Hazard Maps - https://fortress.wa.gov/ecy/coastalatlas/tools/Flood.aspx

  Updated FEMA flood risk maps for Pacific County and the Shoalwater Bay Reservation became effective May 18, 2015. This was too late to be included for analysis for the 2014 plan update, as noted in the plan, but has been utilized for the update.

- HAZUS - https://www.fema.gov/hazus -

  GIS software provided by FEMA used to estimate and visualize potential losses from natural hazards including earthquake and flood. Version 4.2, service pack 3 was released and utilized for this update.

- Tribal Climate Tool – https://cig.uw.edu/resources/tribal-vulnerability-assessment-resources/tribal-climate-tool/.

  This visualization tool enables users to explore and download climate change projections and climate change summaries for selected tribal areas.

- U.S. Climate Resilience Toolkit, Tribal Climate Change Guide - https://toolkit.climate.gov/tool/tribal-climate-change-guide

- Assessment of Coastal Erosion and Future Projections for North Cove, Pacific County, WA Dept. of Ecology, June 2017. https://fortress.wa.gov/ecy/publications/documents/1706010.pdf

This study includes the Shoalwater Bay Tribe's coastal areas. ECY staff provided updated data and visualizations for this mitigation plan update.

- Sea Level Rise Projections for Washington Coast, 2018, Prepared for WA Coastal Resilience Project. http://www.wacoastalnetwork.com/wcrp-documents.html .

  This report contains latest projections of sea-level rise on Washington's coast to the year 2150, and accounts for geological-driven land uplift on the Pacific coast, such as Shoalwater Bay, and sinking in Puget Sound. Land subsidence from an off-shore earthquake is also included.

ADDITIONAL RESOURCES

- Pacific County WA 2015 Hazard Mitigation Plan - https://www.pacificcountysheriff.com/plans.html. This plan is being updated for 2020-21.
- Grays Harbor Hazard Mitigation Planning – 2018 - http://www.co.grays-harbor.wa.us/departments/emergency_management/Hazard_Mitigation_Planning.php
- WA State Enhanced Hazard Mitigation Plan – 2018 - https://mil.wa.gov/enhanced-hazard-mitigation-plan

INTEGRATION INTO OTHER PLANNING EFFORTS

The Shoalwater Bay Tribe recognizes its exposure and vulnerability to natural hazards, and this knowledge plays a key role in much of its day-to-day operations and long-term planning. The Shoalwater Bay Tribal Hazard Mitigation Plan serves as the basis for the tribe's emergency management planning, as well as helps inform its land use and economic development planning and decision making.

INTEGRATION INTO TRIBAL PLANNING EFFORTS

As a tribal sovereign nation, with a small land base, the Shoalwater Bay Tribe does not have the need nor mandated requirement to implement formal planning processes such as land use or zoning plans that could be an area for integration. The tribe does follow best practices in land use and zoning that accounts for the threat from natural hazards, particularly from tsunami inundation, sea level rise and storm surge.

INTEGRATION INTO FEMA PROGRAMS AND INITIATIVES

This plan serves as the basis for the Tribe's emergency management and preparedness efforts, and is a key component of its utilization of FEMA program and initiatives. The planning process allows the Tribe to update its knowledge of hazard exposure and vulnerability, and help focus its mitigation efforts.

Mitigation actions from this planning process can be used to pursue FEMA PDM grants, such as the recent project grant for a tsunami vertical evacuation tower. Issues identified in this plan also led to the Tribe requesting updated National Flood Insurance Program mapping and participation. In the event of

natural disaster, this plan and its planning process will be used to identify recovery initiatives and for utilization of FEMA recovery assistance, including grants and support.

METHOD AND SCHEDULE TO MONITOR, EVALUATE AND UPDATE PLAN WITHIN PLAN UPDATE SCHEDULE

The Shoalwater Bay Tribe's Emergency Management Director will be responsible for the on-going monitoring of the Hazard Mitigation Plan. The Plan and its implementation is a primary work responsibility of the Emergency Management Department. Monitoring efforts include:

- Tracking relevance of the plan over time and noting where priorities need to be updated and/or revised.
- Implementation of mitigation actions, including grant and resource management, as well as documenting efforts.
- Monitoring new tribal property, building, and infrastructure development and the effects of natural hazards on proposed and new developments.
- Tracking new hazard events, as well as documenting damages.
- Monitoring new and emerging research, data/models, and best available science on natural hazards and relevance to the Tribal community.

The Shoalwater Bay Emergency Planning Committee, led by the Emergency Management Director, will review the hazard mitigation plan annually and will update it every five years. Annual reviews will:

- Identify progress made on the implementation of mitigation measures and projects;
- Assess the impacts of recent disasters on the tribal community to determine whether the HMP should be revised based on the new information;
- Examine and ensure that the Mitigation Plan requirements, as well as goals, objectives and actions, are incorporated into current and future Tribal planning processes.

The annual review will occur during the last quarter of each calendar year to coincide with the tribal fiscal year and to prepare for PDM grant deadlines.

The effectiveness of projects and other actions will be evaluated at appropriate, project specific intervals or, at a minimum, when the THMP is updated every five years as required for Tribal plans submitted to FEMA.

The plan update, which will occur every five years, will at minimum, include the following FEMA-required reviews and changes:

- **Changes in Development**

  The plan update shall describe changes in development that have occurred in hazard prone areas since the last plan was approved. If no changes are identified, the plan update shall validate the information in the previously approved plan.

- **Revisions due to progress in tribal mitigation efforts**

  The plan shall describe the status of each mitigation action and/or project identified in the previous plan. For those actions not completed, the plan shall provide a narrative describing the status of the project, including why it was not implemented or removed. The plan shall describe how the tribal government incorporated the previous mitigation plan into other planning mechanisms, as applicable.

- **Revisions due to updates in priorities**

  The plan shall describe if and how any priorities changed (for example, due to disaster events or changes in leadership) since the plan was previously approved. If no changes in priorities are necessary, the plan updates shall validate the information in the previously approved plan.

In addition to the review and revision required, for the Plan update, the Tribe will –

- Engage in a public planning process, as the tribe defines, in order to build community awareness for the plan, and gain feedback and ideas on current and proposed planning efforts and mitigation actions.
- Review and update, as needed, hazard assessments using current data and models and best available science.
- Review and update tribal capabilities and processes, as needed to reflect current conditions.

A draft plan will be submitted to FEMA for pre-approval and to ensure compliance with requirements. Upon pre-approval, the updated Plan will be presented to the Shoalwater Bay Tribal Council for approval and adoption before it is submitted to FEMA for re-approval.

PROCESS FOR CONTINUED PUBLIC PARTICIPATION IN THE PLAN MAINTENANCE PROCESS

In order to continue public participation in the Plan Maintenance and Update process, the Shoalwater Bay Tribal Hazard Mitigation Plan will be available online on the Tribe's website.[3] The Plan will also be available in hardcopy at the Tribal Emergency Management Office. Comments can be submitted via e-mail, telephone or in person at the Emergency Management office, or during Tribal Council meetings relating to the Plan.

The tribe also encourages continued public interest and feedback in the mitigation plan, and apart from formal processes noted, also encourages tribal leaders, staff and community members to discuss, brainstorm and provide feedback and ideas on mitigation initiatives as needed with emergency management staff.

[3] https://www.shoalwaterbay-nsn.gov/home/shoalwater-services/emergency-management/

HAZARD IDENTIFICATION & RISK ASSESSMENT

INTRODUCTION & SUMMARY

This section will identity the natural hazards that affect the Shoalwater Bay Tribe and its lands, the impacts of the hazards as well as the Tribe's exposure and vulnerability to those hazards.

The Shoalwater Tribe's remote geographic location on a low, flat sand spit, facing the Pacific Ocean with a major subduction zone just off-shore, makes it vulnerable to a range of high impact hazards which include:

- Earthquakes
- Tsunamis
- Severe weather and storms

In addition, the tribe can be impacted from:

- Climate change effects
- Coastal Erosion
- Flooding
- Landslides
- Wildfire

PRIMARY THREATS

- The biggest threat to the tribe is **tsunami**. Although low frequency, the impacts would be cataclysmic, virtually destroying all of the Tribe's structures, except those on high ground, within minutes of an earthquake. Structural damage would be about $38 million (total estimated value of Tribe's structures as of 2019). There is potential for mass causalities and injuries, especially the elderly and those with special needs who may not be able to evacuate rapidly. Economic losses from tribal businesses, such as the casino, and unemployment, as well as costs for temporary housing, debris removal and repairs, and rebuilding, would also be catastrophic for the Tribe.

- High frequency, but low to medium impacts are the annually recurring **severe fall and winter storms** that affect the Pacific Northwest coast. The tribe has made efforts to mitigate the effects of storms, but extremely severe events can still have major impacts, including loss of power and communications, isolation due to road closures caused by flooding and landslides, damage to structures from wind and toppled trees, and potential coastal flooding and debris from storm surge.

- **Coastal erosion** of Cape Shoalwater and Empire Spit will continue to be a long-term hazard. Although short-term impacts are minimal, without continued mitigation (such as monitoring, protective berms and beach nourishments projects), the probability of long-term impacts will

increase. These impacts include coastal flooding, loss of land and property, loss of natural resource areas, and increased severity of tsunami impacts.

- **Climate change and global warming** will have long-term impacts on the tribe, including increased precipitation and intensity from fall and winter storms, increased drought and heat during the summer, increasing risk of wildfires, and impacts to the natural environment from warming streams and sea-level rise.

This plan does not exclude from analysis any identified hazard that could potentially impact the tribe.

In addition to updates described in this plan, this 2019 update also incorporates and references information from the 2009 and 2014 plans. Please refer to these plans for additional data and information on the hazards discussed in this section.

2019 UPDATE

This update included an extensive review of the natural hazards affecting the tribe, as well as an update of Tribal impacts based on

- Updated property and structural data and value estimates
- Updated hazards data and maps
- Updated tribal priorities

In general, the impacts to the tribe's people, property and infrastructure remain the same as compared to the previous plan update.

Important changes to highlight include:

- Updated earthquake modelling and scenarios. The severity of potential events increased, but total tribal impacts would be similar. Land subsidence after an earthquake may increase exposure to flooding.
- Tsunami inundation and velocity. New modelling indicated increased severity of an earthquake –triggered tsunami event, including higher inundation zones, as well as modelling indicating high velocities in the Tokeland area. Due to the previous understanding of hazard severity, impacts to the Tribe remain similar as previous estimates.
- Flooding impacts reduced. New FEMA flood zone maps indicate less exposure and impact from flooding. Earthquake-induced land subsidence may change exposure and impacts from flooding.
- Climate change- newly released data and modelling help in estimating potential severity and impact to the Tribe.
- Wildfire –planning committee staff noted an increase in brush and wildfires, possibly related to climate-change induced drought and dry conditions.

It should also be noted that this section has been reformatted to meet current FEMA tribal planning requirements and to better present relevant information about natural hazards and the Tribe's risks and impacts.

TRIBAL PLANNING AREA

This plan update encompasses the current and historical lands, as well as any future properties acquired, of the Shoalwater Bay Tribe and its ancestors, including its Reservation, established in 1866 and expanded in 1977, as well as additional trust lands and fee properties. This includes all buildings, infrastructure, natural resources, and cultural/historic village & archaeological sites, as well as its tribal members, employees and guests on its lands and properties.

This planning scope does not limit in any way the Shoalwater Bay Indian Tribe's hazard mitigation and emergency management planning concerns or influence nor its sovereignty as a Tribal Nation.

This risk assessment will analyze the tribe's reservation and properties as of 2019, as well as properties planned to be acquired within the next few years, as applicable.

Figure 14: Shoalwater Bay Tribe - general location

The Shoalwater Bay Reservation is located along the north coast of Willapa Bay, Pacific County, Washington, centered around geographic coordinates **46.725 N, -124.02 W**.

State Route 105 and Tokeland Rd are the major roads serving the tribal community.

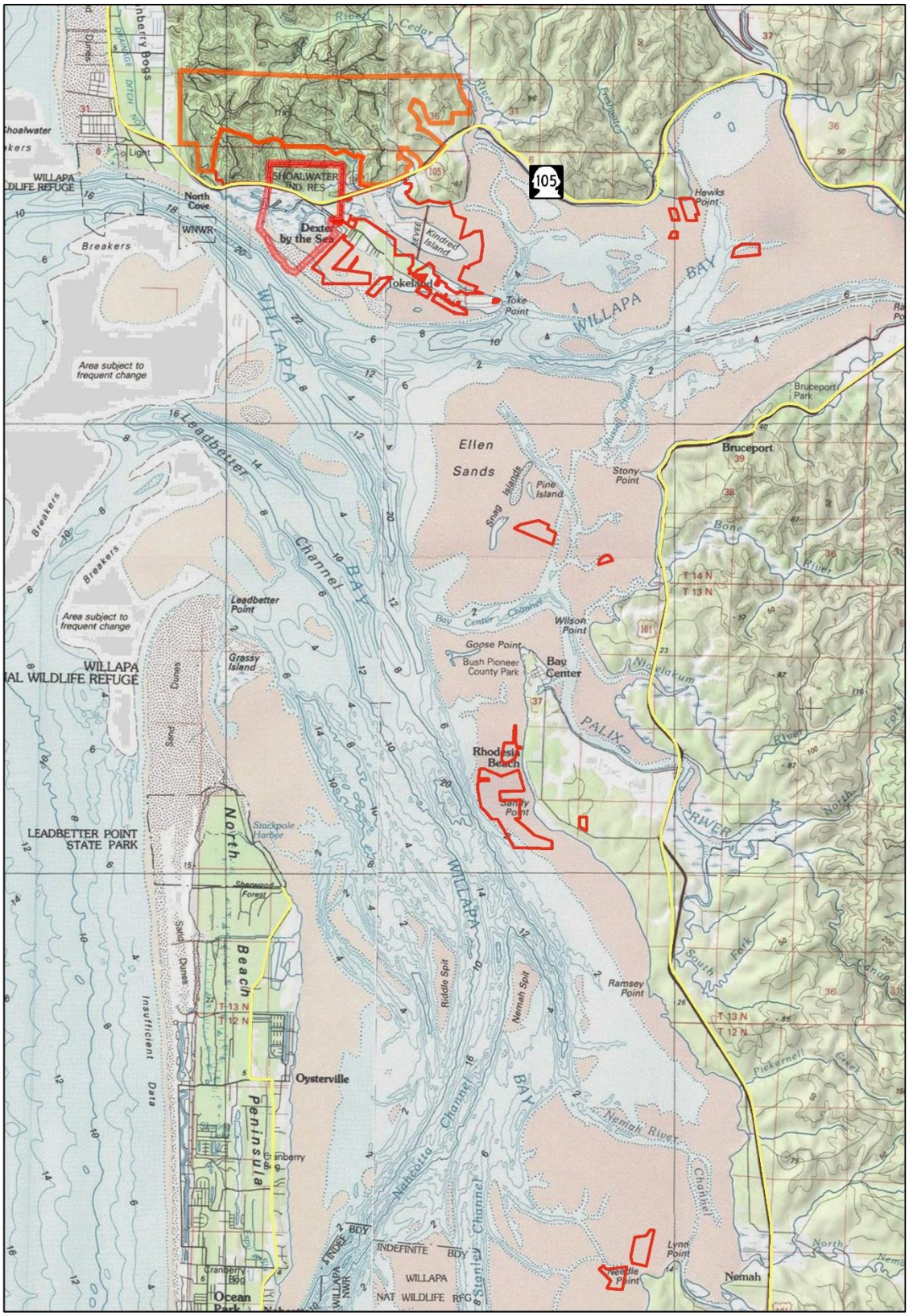
2019 PLAN UPDATE

This risk assessment has been updated to include and analyze tribal properties, buildings and infrastructure that has been acquired, built or expanded since the previous plan update in 2014.

The Tribe's building inventory was updated for HAZUS-MH analysis, using 2018-9 building insurance data provided by the Tribe. Of the 108 structures mapped for the update, 73 were included for HAZUS. Missing structures generally include sheds and garages.

Due to cultural sensitivities, detailed analysis of historic village and archaeological sites was not conducted, although potential impacts will be discussed where applicable.

Figure 15: Tribal planning area - Willapa Bay (tribal land & properties in red)



CLIMATE CHANGE

LOCATION AND EXTENT

Climate change is defined as the long-term shift in global or regional climate patterns. Although climates are always changing in the long-term, during the last half century, the planet has been experiencing a period of rapid climate change, along with a rise in global temperatures.

The 2016 report by the Northwest Treaty Tribes *"Climate Change Impacts to Tribal Rights and Resources"* notes[4]:

> "Global warming is the increase in global average temperatures that has been recorded around the world. Rising temperatures cause changes to long-term patterns and variability of climate factors such as wind, humidity, and the type and amount of precipitation. The dominant driver is the human-caused buildup of greenhouse gases such as carbon dioxide (CO2), methane, and other heat-trapping gases in the atmosphere, largely due to burning fossil fuels and changing land use.
>
> The impacts of climate change are already happening. These impacts are projected to continue or accelerate into the future. In the Pacific Northwest (PNW), the observed and projected trends in physical systems include the following: ·
>
> - Warmer air temperatures;
> - Shrinking glaciers;
> - Less snowfall;
> - Decreasing summer streamflows;
> - Increasing winter peak flows;
> - Changes to timing of peak and base flows;
> - Higher stream and lake temperatures;
> - Lower levels of dissolved oxygen in streams;
> - More sediment delivered into, carried by, and deposited in streams;
> - Drying out of wetlands;
> - Increased frequency and size of wildfires;
> - Greater probability of landslides;
> - Warmer ocean temperatures;
> - Rising sea levels;
> - Stronger storms and greater storm surge; and
> - Changing ocean chemistry, including ocean acidification."

The Shoalwater Bay Tribe's traditional and current homelands on and around the Willapa Bay estuary will be affected by rapid climate change caused by global warming.

[4] https://nwtreatytribes.org/climatechange/ executive summary, p. vi

PAST EVENTS AND PROBABILITIES OF FUTURE EVENTS

PAST EVENTS

Although climates, on a long-term scale, are always in flux, the rapid climate change caused by recent global warming is a phenomena unprecedented in recorded history. Without past events, it is challenging to predict and mitigate against the effects of climate change.

PROBABILITY OF FUTURE EVENTS

For climate change, estimating probability of future events is not applicable for estimating impacts and vulnerability, as it's the secondary effects of climate change that will impact the Tribe. Instead climate projections using models will be used to estimate different impacts based on different scenarios.

The University of Washington Climate Impact Groups' "Tribal Climate Tool" was used for these estimates[5]. Analysis was conducted for the Shoalwater Bay Tribe. The model utilizes the WA Dept. of Ecology's Water Resource Inventory Area (WRIA) 24, or Willapa watershed. The model utilizes two future greenhouse gas emissions (low and high) over three future time periods (2010-39, 2040-69, 2070-99).

DESCRIPTION OF IMPACTS, SUMMARY OF VULNERABILITY

IMPACTS

The Tribal Climate Tool was utilized to identify impacts from climate change to the Shoalwater Bay Tribe. For this mitigation plan, the impacts short term (2010-2039, compared with data 1971-2000) and a high emission scenario are summarized below. The tool lists a wide range of climate-related variables. This report will list those related to natural hazards in this plan. The full climate report can be found online[6].

PRECIPITATION

From April to September, total precipitation is projected to decrease by 0.6 inches.

From October to March, total precipitation is expected to increase by 1.2 inches.

Decreased rain in the spring/summer will increase risk of drought and wildfires, while increased precipitation during the fall/winter rainy season will mean increased risk of severe weather, flooding and landslides.

[5] https://cig.uw.edu/resources/tribal-vulnerability-assessment-resources/tribal-climate-tool/

[6] https://climate.northwestknowledge.net/NWTOOLBOX/tribalProjections.php select "Shoalwater Bay Tribe"

Figure 16: Projected Change in Oct. - Mar. Precipitation 2010-39

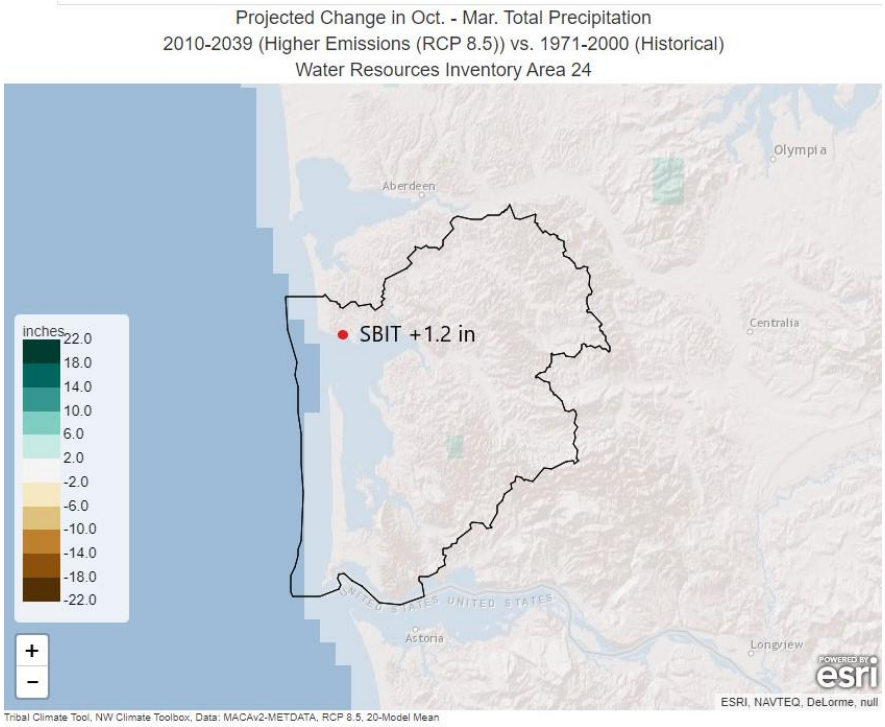
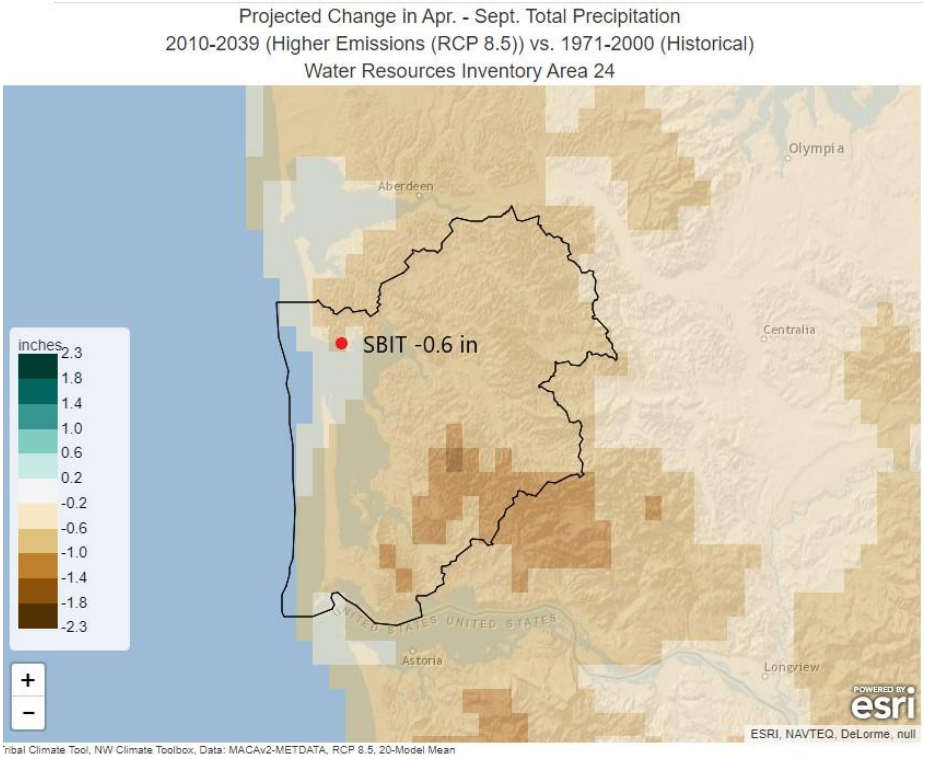


Figure 17: Projected Change in Apr. - Sept Precipitation, 2010-39



FIRE DANGER DAYS

Very High Fire Danger

The model projects that “Very high” Fire Danger days per year will increase by 7 days.

Extreme Fire Danger

The model projects that “Extreme” Fire danger days will increase by 3 days.

Figure 18: Projected Change in Annual Days of "Very High" Fire Danger 2010-39

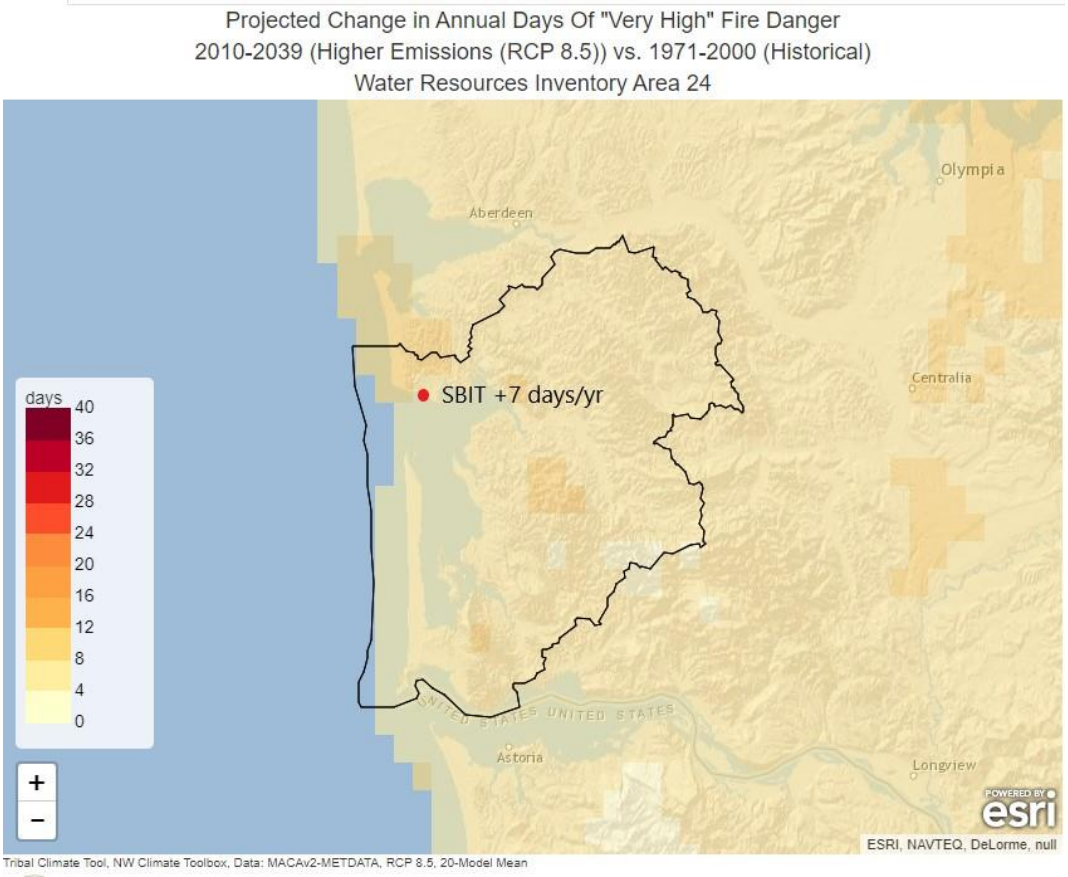
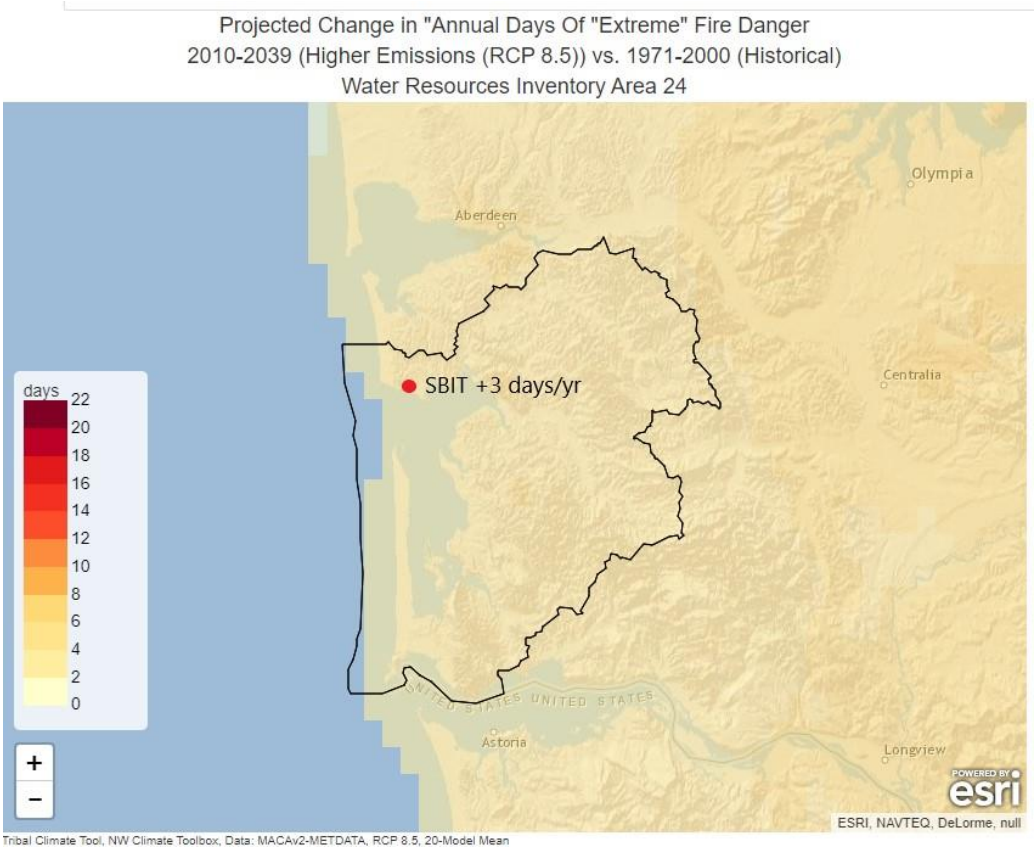


Figure 19: Projected Change in Annual Days of "Extreme" Fire Danger, 2010-39



SEA-LEVEL RISE

The model estimates that for the time period 2020-39, sea-level around Shoalwater Bay Reservation will rise about 0.2 feet. It should be noted that the Pacific Coast of Washington is rising due to plate tectonics[7]. Of concern is the long-term estimate of sea-level rise. From 2090-2190, sea level at Shoalwater Bay is estimated to increase by 1.7 feet. A full list and description of sea-level rise projections and probabilities are listed in Appendix D.

VULNERABILITY

This section will describes the Tribe vulnerability to climate change in the short term 2020-39. Longer term effects will increase identified vulnerabilities as well as create new ones.

BUILDINGS AND INFRASTRUCTURE

The main vulnerability will be due to increase Fire Danger days in the spring/summer as well as increased dry and drought conditions. This will lead to an increase threat from wildfire and brush fires,

[7] The Wa Coast Resiliency Project estimates that the Shoalwater Bay tribal area is rising 0.4 feet per century

which can threaten the Tribe's housing, enterprise and government buildings. Drought can affect water supplies, for drinking as well as fire suppression. Fires would be localized and limited to a small number of adjacent structures.

Sea-level rise and increased fall/winter precipitation are not major vulnerabilities in the short-term, but can potentially increase threat from coastal flooding, as well as landslides.

ECONOMIC ASSETS

The short-term effects of climate change would be minimal but could begin to affect the viability of the Tribe's oyster beds, timberlands and tourism industry. The selling of fireworks and celebrations around the Fourth of July may be affected as drought and fire danger days increase.

COASTAL EROSION

LOCATION AND EXTENT

The southwest Washington Coast has been a major erosion hotspot in the United States for the past century.

Erosion along Washington's southwest coast is affected by: jetties, dams, sediment supply, geologic history, wave action, and weather.

- **Jetties caused beaches to grow and possibly erode**
  Jetties have influenced accretion and possibly erosion patterns on the beaches over distances of 12 miles (20 kilometers) or more.
- **Dams on the Columbia River have reduced the sand supply**
  Dams on the Columbia River have reduced the sand supply to coastal beaches by two thirds.
- **Beach growth has slowed**
  Accretion rates along the coast have slowed dramatically over the past few decades.
- **Beaches that once grew rapidly are now eroding**
  High rates of erosion are occurring along sections of beach that previously grew most rapidly.
- **El Niño impacts the shoreline**
  El Niño, a recurring atmospheric phenomenon, can bring higher sea levels, intense storms, and extreme high waves from the southwest.
- **Earthquakes hit Washington's coast**
  Large earthquakes in the past caused the coast to sink 3 to 6 feet suddenly (1 to 2 meters).
- **Columbia River sand built beaches and barriers**
  Supplied by sand from the Columbia River, beaches on the Long Beach Peninsula grew for 4,000 to 5,000 years.

Washaway Beach and Empire Spit at Cape Shoalwater is the most rapidly eroding beach on the U.S. Pacific Coast. The Cape has been eroding an average of 100 feet year for the last century. At one time Cape Shoalwater provided protection to shallow North Cove and its excellent clamming, and the Shoalwater Bay Reservation on the landward side, from the full onslaught on winter storms and waves. Today Cape Shoalwater Spit is gone, North Cove has filled-in with invasive spartina grass, and the remaining Graveyard Spit and tide/marshlands serves as the only barrier for the Reservation from the ocean.

PAST EVENTS AND PROBABILITIES OF FUTURE EVENTS

PAST EVENTS

During the early 1900s, Cape Shoalwater, a massive spit, began eroding rapidly. Between 1890 and 1965, the cape eroded 12,303 feet (3750 meters) at about 124 feet per year (37 meters).

During the 1920s, in the nearby town of North Cove, over 30 homes were claimed by erosion or relocated. In the years that followed, erosion destroyed a lighthouse, a life-saving station, a clam cannery, a school, and a Grange Hall. Erosion also forced the relocation of a cemetery and State Highway

105. In recent decades, erosion has destroyed 20 homes, private property, and part of the Willapa National Wildlife Refuge.

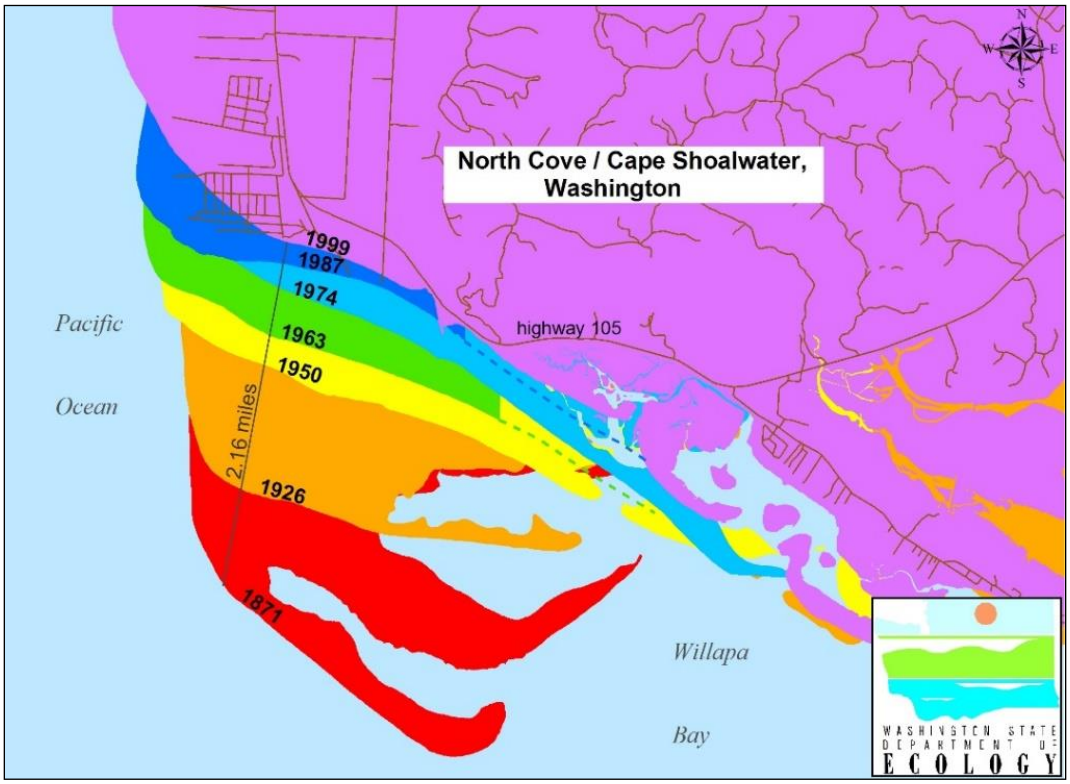
For the Shoalwater Bay Tribe, this led to extensive loss it its tidelands, as well as valuable clam beds and other tidal natural resources. It should be noted that erosion did not directly impact any tribal uplands or structures.

The Shoalwater Reservation has had a history of flooding and storm damage which was further exacerbated by coastal erosion. On March 3, 1999, a combined storm and high tide caused severe flooding of the Shoalwater Reservation shoreline and surrounding community. The Reservation also experienced severe flooding and debris damage from winter storms in February 2006 and December 2007. The flooding is believed to be a direct result of the erosion and breaching of the barrier dune on Empire Spit that fronts the Tokeland Peninsula.

Since the 2014 plan update, the beach has continued to erode, and the WA State DOT and US Army Corp of Engineers have implemented mitigation measures to reduce its hazard. WSDOT implemented Erosion control measures in 2015 and 2017 on State Route 105 northwest of the reservation to prevent its erosion.

The USACE constructed a barrier dune on Graveyard Spit in 2013 (sometimes the name Empire Spit is used) in 2013 to protect the Shoalwater Bay Reservation, which needed to be repaired and expanded in 2018.

Figure 20: Erosion of Cape Shoalwater since 1871

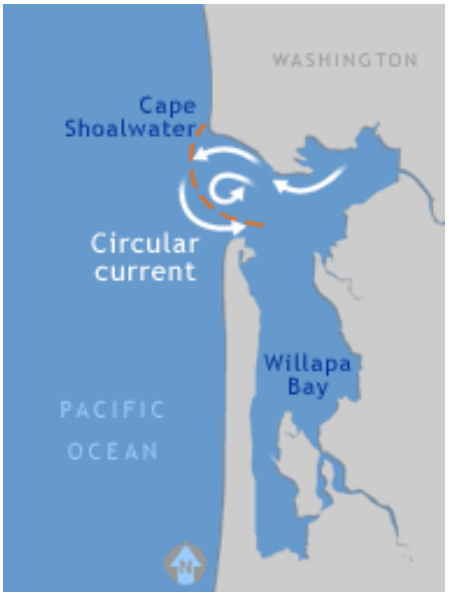


PROBABILITY OF FUTURE EVENTS

CAUSES OF EROSION AT CAPE SHOALWATER

A tidal channel is deepening and migrating northward (an 8 to 12 year cycle.) As the channel migrates, it cuts into the shore. As the channel migrates northward, an underwater sand bar forms near the entrance of Willapa Bay. Waves push sand south, into Willapa Bay, forcing the northern channel to bend south. In time, the tidal channel breaks through the sand bar. The cycle begins again, as the separated sand bar moves to the center of Willapa Bay's entrance.

Figure 21: Cape Shoalwater Erosion Cycle



The Army Corps of Engineers has found in their Erosion Mitigation Study that the Shoalwater Bay Reservation is no longer threatened by direct coastal erosion of developed Tribal lands.

The northward migration of the Willapa channel has stopped. Since the mid-1980s, the slope of the north bank of the main channel has been constant and has remained in a fixed position. This strongly indicates that the channel encountered hard strata that are resistant to erosion, sparing the last of the severely damaged dunes fronting the Shoalwater Bay Reservation shoreline.

Nonetheless erosion to the remaining sand dunes and increased flooding associated with this erosion remains a major concern that needs to be mitigated.

DESCRIPTION OF IMPACTS, SUMMARY OF VULNERABILITY

IMPACTS

The impacts to the Shoalwater Bay Tribe from the erosion of Cape Shoalwater have been severe. Although the Tribe's properties and structures are not at risk of direct erosion, the erosion of Washaway Beach/North Cove have led to the loss of valuable clam beds and tidal marsh. Invasive spartina grass has taken root in the remaining lands.

The largest impact from coastal erosion has been the loss of protective barrier beaches that protects the Tribe's lands from storm surges, flooding and debris. A 1,700 foot berm was constructed in 2001 and extended by 300 feet in 2007 and has generally served its purpose in mitigating flooding, but storm surge and debris continues to be an issue.

Erosion has also continued to impact the tribe's only road north, SR 105. WSDOT implemented erosion control projects for the road in 2015 and 2017 in order to maintain the viability of the road and allow access north to Westport.

The biggest impact from coastal erosion is loss of the barrier beaches which could buffer the inundation and velocity of a tsunami. Currently the Shoalwater Bay Tribe could bear the full brunt of an in-coming tsunami.

VULNERABILITY

BUILDINGS AND INFRASTRUCTURE

The tribe's buildings and infrastructure are not directly vulnerable to coastal erosion, but continued erosion of Graveyard Spit and North Cove increase the impacts from storm surge and debris. Structures most vulnerable are those adjacent to the shoreline, such as the Tribal Center, Georgetown Station store/offices, Tradewinds Hotel and buildings/homes in the Dexter-by-the-Sea community.

ECONOMIC ASSETS

Storm surge and debris could potentially affect the Georgetown Station, which is located adjacent to the protective berm, as well as the Tradewinds Hotel. Although the Cape Shoalwater erosion destroyed the clamming industry, continued erosion threatens any potential for revitalization of this industry at North Cove.

NATURAL RESOURCES

Erosion has destroyed acres of the Tribe's tidal lands, as well as critical habitat located within it. The remaining land has been overtaken by invasive spartina cordgrass, which "out competes native plant species, including rare and endangered plant species, reducing marsh biodiversity and ecology functions"[8].

[8] https://invasivespecies.wa.gov/priorityspecies/spartina-cordgrass/

EARTHQUAKES

 [9]

LOCATION AND EXTENT

The Pacific Northwest, along with California, is the most seismically risky area of the United States from large damaging earthquakes. Within Washington State, its Pacific Coast is the most vulnerable, subject to intense shaking, liquefaction, land subsidence, and devastating tsunamis.

The Shoalwater Bay Tribe, located on a sandy coastal plain at Willapa Bay, can be affected by Subduction Zone earthquakes and Deep earthquakes.

DNR data shows the existence of past Deep earthquakes around the Reservation/Willapa Bay area, but it is not known if these types of events can cause any significant damage.

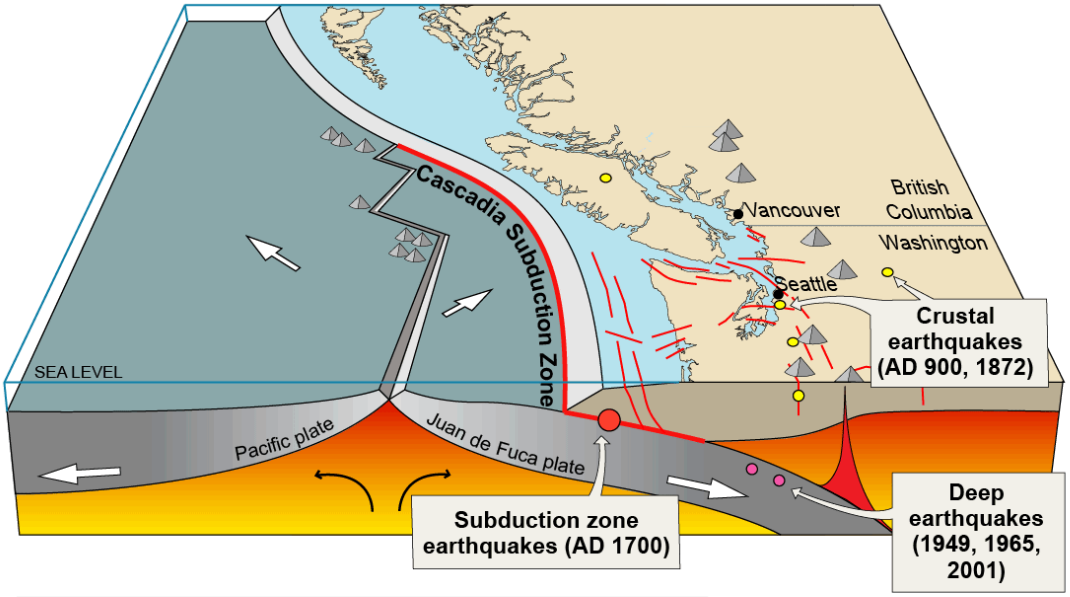
DNR data also shows a complex of faults, named the Willapa Fault Zone, in the region, but it is not known at this time if these faults are seismically active or can cause damage.

The primary threat to coastal communities, such as the Shoalwater Bay Reservation, is the Cascadia Subduction Zone, and the earthquakes/tsunamis generated by its rupture. It is located about 485 miles off the coast from the Reservation. It is estimated that an earthquake on this fault can generate a magnitude 9+ megathrust earthquake.

The secondary effects of Cascadia earthquake would have major impacts. Tsunami is discussed in its own section. The impacts and vulnerability to subsidence will be discussed in the Flood section in more detail.

[9] Graphic theme of Nuu chaa nulth (Nootka) cloth screen depicting thunderbird and whale. (Malin, 1999) – accessed from https://pnsn.org/outreach/native-american-stories/thunderbird-and-whale/totem-art

Figure 22: Types of Earthquakes, Pacific NW



Source	Max. Size	Recurrence
Subduction zone	M 9+	200–600 years
Deep Juan de Fuca plate	M 7+	30–50 years
Crustal faults	M 7+	Hundreds of years?

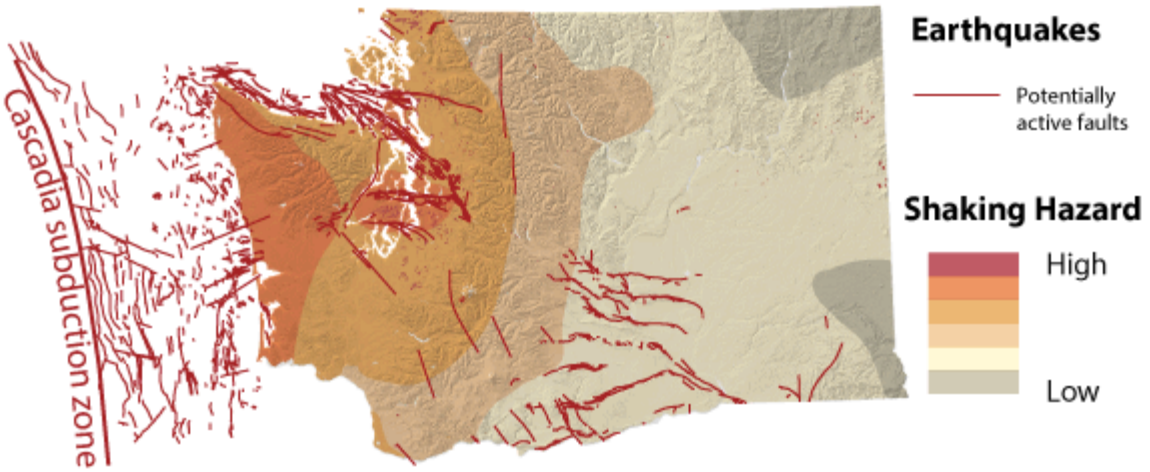
Volcano

Active crustal fault

Active plate boundary fault

*figure modified from USGS Cascadia earthquake graphics at http://geomaps.wr.usgs.gov/pacnw/pacnweq/index.html

Figure 23: WA Earthquake Shaking Hazard[10]

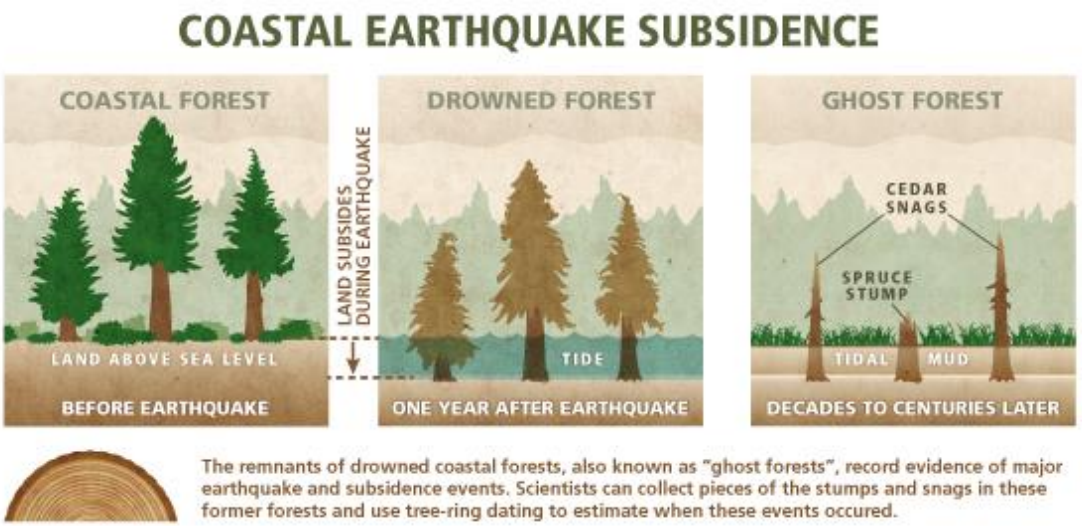


[10] https://www.dnr.wa.gov/programs-and-services/geology/geologic-hazards/earthquakes-and-faults#.5

SUBSIDENCE

Based on the deformation model for the Cascadia L1 scenario Tokeland Peninsula has 2.3-2.6 meters (7.5-8.5 feet) of subsidence. The amount of subsidence from the next subduction zone event will vary depending on the severity of the earthquake, however in the 3,500 year land based record of earthquake subsidence, the largest preserved event only approached 1.75 meters (5.7 feet). Thus the modeled value of 2.6 meters would be a conservative value and appropriate for planning purposes.

Figure 24: Coastal Earthquake Subsidence process



PAST EVENTS AND PROBABILITIES OF FUTURE EVENTS

PAST EVENTS

There have been numerous earthquakes experienced in the Willapa Bay area for hundreds of generations of people. This section will recount some of the past events felt here, but is by no means exhaustive.

- **1700 Cascadia Subduction Earthquake**

  Between 9:00 PM and 10:00 PM, local time, on January 26th 1700, a great earthquake shook the Pacific Northwest. This quake, with magnitude estimated at 9.0, rocked the region with strong shaking for several long minutes while coastal Washington plummeted as much as 5 feet relative to coastal waters. This earthquake generated a massive tsunami that affected many of the Indian Tribes living on the coast and adjacent bays and creeks and was recorded in their folklore and histories. The tsunami generated also affected Japan.

  This earthquake is used as the basis to help predict and prepare for future events.

- **1872**, Entiat, WA (Chelan Co.) On the evening of December 14, 1872, severe earthquake shaking was widely felt in Washington, Oregon, British Columbia, Idaho, Montana, and Alberta

- **1949**, Nisqually Delta Area north of Olympia: This earthquake had a magnitude of 7.1 on the Richter scale
- **2001**, Nisqually Delta Area north of Olympia: This earthquake had a magnitude 6.8 on the Richter scale.

The Pacific Northwest Seismic Network[11] published a compilation of past earthquake events in Southwest Washington that was produced by Pacific County Historical Society and Museum **"Columbia River Chronology Historical Dates"**

SW WASHINGTON EARTHQUAKES

- December 2, 1841 earthquake near Ft Vancouver Washington *(Wong and Bott p 128)*
- December 23, 1854 tsunami recorded at Astoria *(Lander p 121)*
- December 24, 1854 tsunami recorded at Astoria *(Lander p 121)*
- April 3, 1868 tsunami recorded at Astoria *(Lander p 122)*
- August 14, 1868 tsunami recorded at Astoria *(Lander p 123)*
- August 23, 1872 teletsunami recorded at Astoria *(Lander p 24, 47)*
- October 12, 1877 earthquake tremors felt in Astoria oscillating from east to west *(Daily Astorian October 13, 1877 p 1)*
- December 12, 1880 2 earthquakes shocks felt *(Daily Astorian [Dec?] 14, 1880 p 3; Algermissen and Harding)*
- April 30, 1882 Severe tremors *(Daily Astorian May 2, 1882 p 3)*
- May 3, 1882 p 3 mentions that earthquake was felt in Westport and Ft Canby about 10:30 pm [on] April 30. Daily Astorian May 4, 1882 tells that 3 shocks vibrated from SW to NE on April 30.
- March 27, 1884 earthquake felt in Hoquiam *(Workman p 38)*
- November 30, 1891 slight earthquake on Grays Harbor *(Workman p 49)*
- February 2, 1892 earthquake in Astoria *(Bott and Wong p 118)*
- February 26, 1895 earthquake hits Astoria *(Daily Morning Astorian p 4)*
- August 6, 1899 earthquake hits Astoria *(Astoria Daily Budget August 8, 1899 p 4)*
- November 20, 1899 tidal wave at Shoalwater Bay *(Astoria Daily Budget November 20, 1899 p 4)*
- September 12, 1903 quake hits city *(Astoria Daily Budget p 4)*
- March 16, 1904 Earthquake felt along Washington Coast and in Aberdeen, Hoquiam *(Lander p 59, 127 not mentioned in Astoria newspapers)*
- March 30, 1904 possible tsunami off Washington coast caused flooding *(Lander p 19 not mentioned in Astoria newspapers)*

[11] http://www.pnsn.org/

- January 11, 1909 Grays Harbor Earthquake *(Workman p 68)*
- November 9, 1920 earthquake hits Astoria *(Astoria Budget p 1)*
- November 29, 1920 slight earthquake hits Astoria *(Astoria Budget p 1)*

There have been numerous other earthquakes felt in the Shoalwater Bay area over the years. The most severe of these can be attributed to the numerous faults found in Western Washington. The most severe crustal earthquake ever felt in Washington occurred in the North Cascades area in 1872. **Table 5** is a summary of large earthquakes that have occurred in Western Wa.

Table 5: Large Earthquakes in WA State

Date	Location	Magnitude	Type
1872	Entiat or North Cascades	6.8 or 7.4	Crustal Zone
1882	Olympic Area	6.0	Deep Zone
1909	Puget Sound	6.0	Deep Zone
1915	North Cascades	5.6	--
1918	Vancouver Island	7.0	--
1920	Puget Sound	5.5	--
1932	Central Cascades	5.2	Crustal Zone
1939	Puget Sound	5.8	Deep Zone
1945	North Bend	5.5	Crustal Zone
1946	Puget Sound	6.3	Deep Zone
1946	Vancouver Island	7.3	Deep Zone
1949	Olympia	7.1	Deep Zone
1965	Puget Sound	6.5	Deep Zone
1981	Mt. St. Helens	5.5	Crustal Zone
1990	NW Cascades	5.0	Crustal Zone
1995	Robinson Point	5.0	Crustal Zone
1996	Duvall	5.6	--
1999	Satsop, Grays Harbor Co.	5.6	Deep Zone
2001	Nisqually\Puget Sound	6.8	Deep Zone

PROBABILITY OF FUTURE EVENTS

The Cascadia subduction zone last ruptured over 300 years ago on January 26, 1700. The average time between large earthquakes is about 535 years, but has been as little as 200 years, and more than 1,000 years.

Other faults in the region, such as the Willapa Bay Fault Zone, could be produce strong earthquakes, but it is not known at this time if there has been past activity or what magnitude a future event could generate.

DESCRIPTION OF IMPACTS, SUMMARY OF VULNERABILITY

IMPACTS

Historic records and past events, previous versions of the Tribal Hazard Mitigation Plan, a review of state and county plans, as well as FEMA-HAZUS MH models conducted for the Tribe and by WA DNR were used to determine impacts to the Tribe from an earthquake. HAZUS-MH analyses, including updated building inventory, will be maintained by the tribe.

A Cascadia 9.0 and Cascadia North 8.3 subduction zone earthquake will be used to discuss impacts, but it should be noted that other earthquake events would have similar, though less severe impacts.

Updated HAZUS-MH analysis utilized the modelled Cascadia 9.3 event to estimate impacts.

All of the Tribe's people, property and structures would be impacted by an earthquake. Disruptions caused by power outages and loss of communications would also have economic impacts, particularly to the Tribal Casino.

The area would experience severe shaking, a level 8 on the Modified Mercalli Intensity (MMI) Scale and potentially cause liquefaction.

The USGS defines MMI 8 as "Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned[12].

All of the Tribe's buildings and infrastructure, apart from those on Eagle Hill Road, are in a "Moderate to High" Liquefaction zone. This could further impact structures, and undermine foundations.

The Tribe has an estimated 108 structures as of 2019, worth about $38 Million total. Updated HAZUS modelling, conducted in 2019, indicated increased earthquake impacts.

[12] https://www.usgs.gov/natural-hazards/earthquake-hazards/science/modified-mercalli-intensity-scale?qt-science_center_objects=0#qt-science_center_objects

- 88% probability that ALL structures have at least extensive damage
- 66% probability that ALL structures have complete damage

Table 6 shows the HAZUS damage estimates conducted for the 2014 plan update. As the 2014 HAZUS data was not available for this report, it is not known how to account for differences in results.

Tribal infrastructure, such as the coastal berm, and the engineered dune on Graveyard Spit may also suffer damage and loss of functionality due to severe shaking and liquefaction.

Table 6: Estimated damage to tribal facilities from Cascadia EQ events – 2014 update

ESTIMATED DAMAGE TO FACILITIES FROM **CASCADIA 9.0M** EARTHQUAKE					
Category	**No Damage**	**Slight Damage**	**Moderate Damage**	**Extensive Damage**	**Complete Damage**
Tribal Facility	4.90%	35.20%	50%	9.20%	0.60%
Commercial	4.20%	34.30%	51.80%	9.10%	0.60%
Industrial	6.50%	45.50%	44.80%	3.10%	0.10%
Residential	7.50%	47.50%	42.30%	2.60%	0.00%
Average	6.60%	43.70%	45%	4.50%	0.20%
ESTIMATED DAMAGE TO FACILITIES FROM CASCADIA 8.3M **EARTHQUAKE**					
Category	**No Damage**	**Slight Damage**	**Moderate Damage**	**Extensive Damage**	**Complete Damage**
Tribal Facility	21.30%	48.10%	28.80%	1.70%	0.10%
Commercial	23.30%	50.60%	25.10%	1.10%	0.00%
Industrial	29.20%	55.00%	15.50%	0.30%	0.00%
Residential	29.80%	54.80%	15.20%	0.30%	0.00%
Average	27.60%	53.30%	18.50%	0.60%	0.00%

The secondary hazards caused by a Cascadia Earthquake would have much more severe impacts than the earthquake itself.

- Landslides could block SR 105, limiting access in and out of the Reservation, and prevent emergency services from accessing the area except by air or possibly boat.
- A tsunami would most likely destroy all the people, buildings and infrastructure at sea-level.
- Post –earthquake land subsidence of up to 8.5 feet, would permanently inundate all of the Tribe's coastal properties at high tide.

VULNERABILITY

The Shoalwater Bay Tribe's remote geographic location, on a flat, narrow and sandy coastal plain, with one of the world's most active subduction zone fault just off-shore, makes it one of the most vulnerable communities in the nation to the impacts from an earthquake, as well as the secondary hazards of tsunami and land subsidence.

Limited governmental capabilities and economic assets also limit post-disaster response and recovery.

The populations most vulnerable to an earthquake are those with limited resources, with special needs, and the elderly. Many structures, as well as the personal property within them, may be damaged or destroyed. Vulnerable populations may rely on these structures and property after the disaster, and won't be able to utilize or replace, and will need to rely on outside help for personal needs and shelter.

Many structures, including tribal housing, are older and not built to the most current seismic standards, and thus are vulnerable to damage from severe shaking and liquefaction.

The tribe is also vulnerable to isolation from blocked roads, loss of power and communications. These systems are owned and operated by non-tribal entities, and the tribe would most likely have to wait while systems are prioritized and restored in higher population areas.

The Tribe's economy would also be affected, as the Tribe's casino may be closed or would have a significant loss of revenue while the region recovers from the earthquake. There is also concern of loss of employment by tribal members or staff as transportation and business closures prevent work and income.

Lastly, it should be noted that the secondary effects of a Cascadia earthquake, land subsidence and tsunami, is the Tribe's biggest vulnerability. Either event, or combined, would most likely make the Tribe's current development footprint on the coastal plain uninhabitable due to damage and future high tides and storm surges.

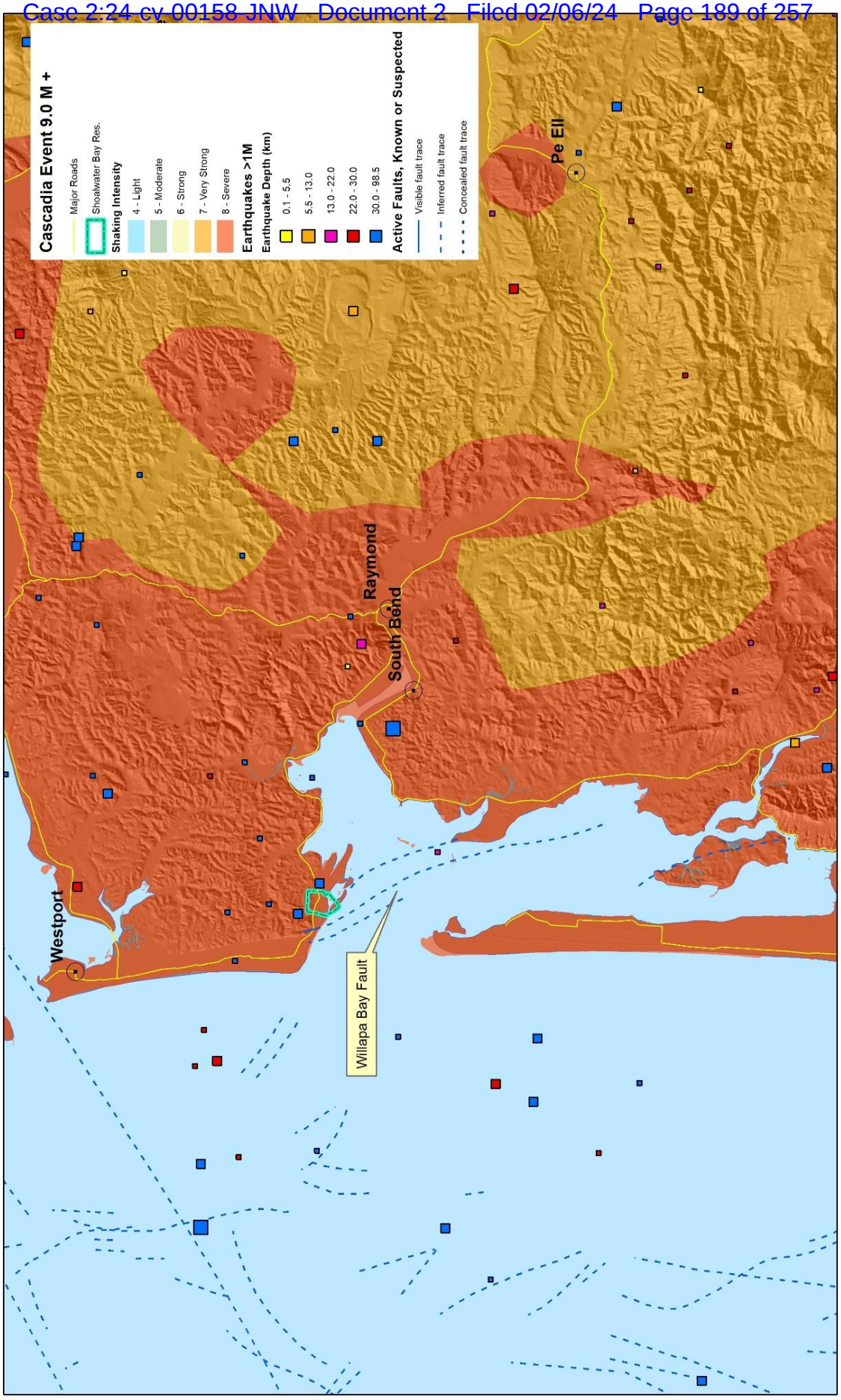


Figure 25: Cascadia 9M Shaking Intensity Map

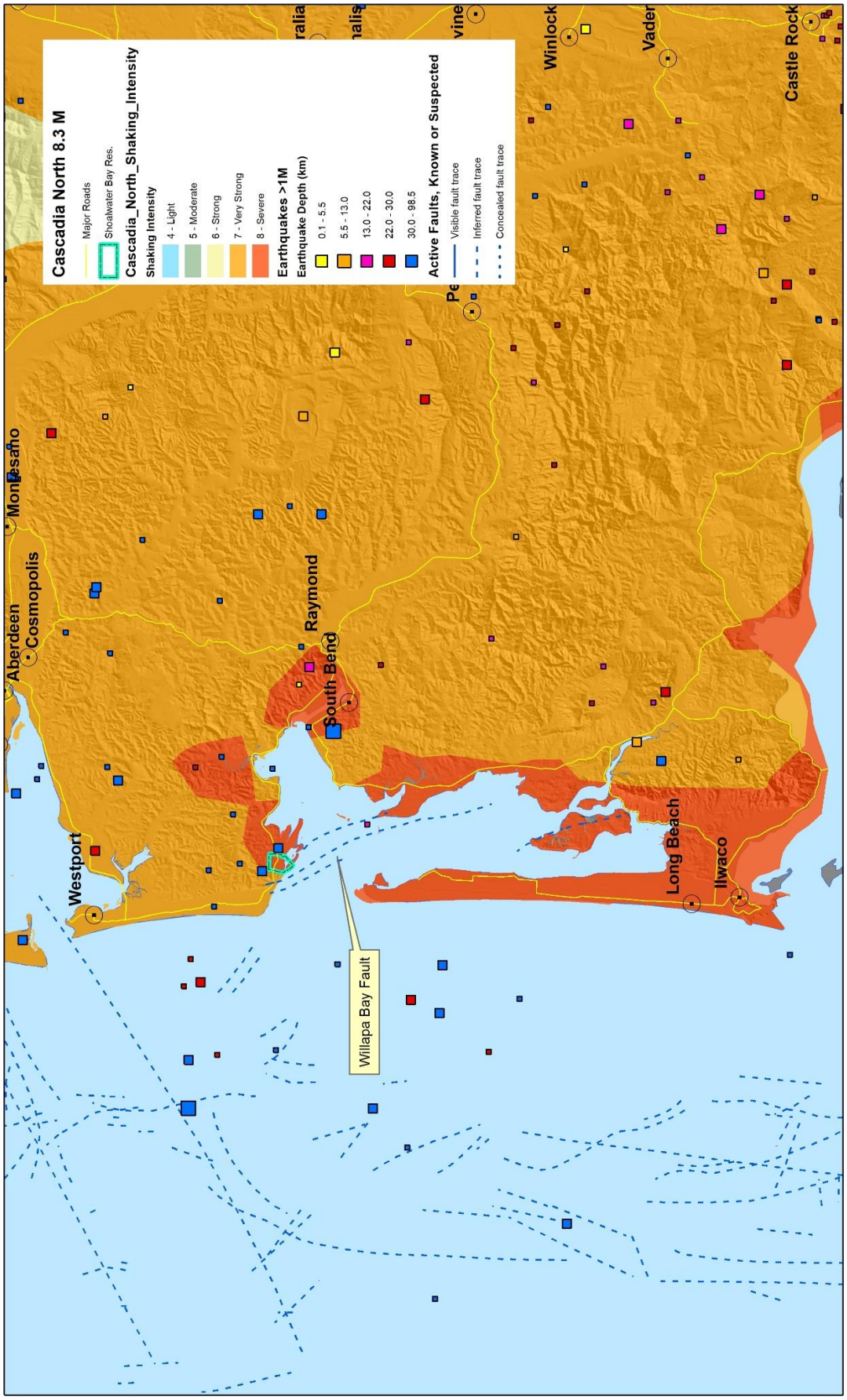


Figure 26: Cascadia North 8.3M Shaking Intensity Map

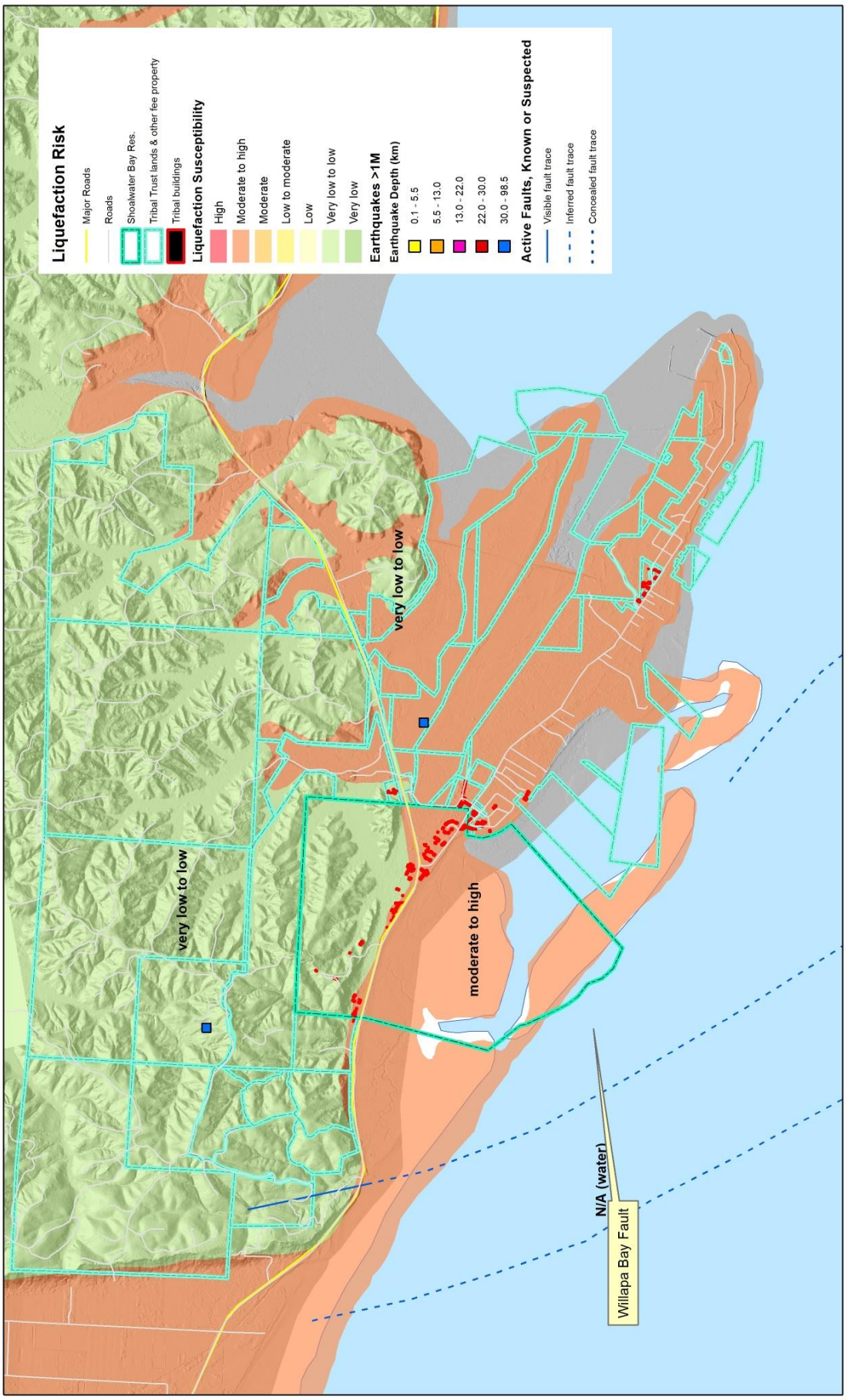


Figure 27: Liquefaction Risk – detail

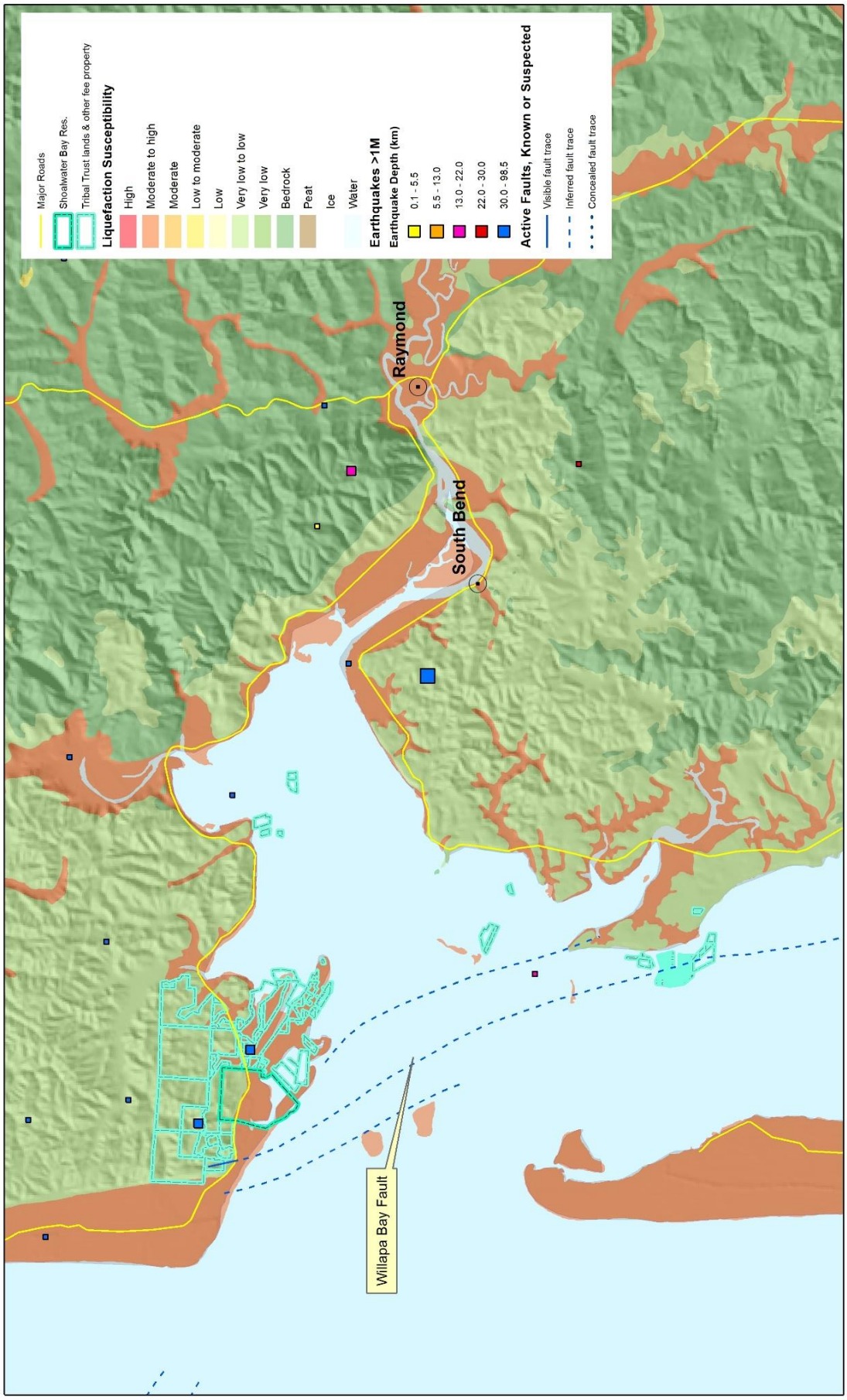


Figure 28: Liquefaction Risk - regional

FLOODING

LOCATION AND EXTENT

The Shoalwater Bay Tribe is affected by coastal storm surge flooding.

The Georgetown area of the Reservation was generally protected from storm surges until the late 1800s when changing ocean patterns began eroding Cape Shoalwater, exposing the Reservation area to the full extent of ocean waves except for the protection from the remaining beach dune at Grave Yard Spit.

Until the 2015 FEMA Flood Risk map update, the Flood Insurance Rate Map showed most of the tribe's property and buildings exposed to floods. The revision, using more detailed mapping and reflecting the construction of the protective berm, shows little to no exposure from flooding.

Figure 29 - 1908 Flood at Tokeland[13]

PAST EVENTS AND PROBABILITIES OF FUTURE EVENTS

PAST EVENTS

The Pacific Co Flood insurance Study (written in 1985) identified past flooding events:

[13] Provided by Pacific Co. Historic Society #1998.63.14. No addition information is available about this hazard event

"Major coastal and tidal floods, in order of highest water, have occurred in 1934, 1933, 1973, 1969, 1972 and 1960."[14]

More recent events include:

- **1999 storm surge**
  On March 3, 1999, a storm surge of 4.6 feet, accompanied by 49.7 mile an hour winds, caused widespread coastal flooding. Wave heights exceeded 29.5 feet for over 5 hours, peaking at 34.8 feet. At Ocean Shores, several houses were damaged and a public restroom was destroyed. This combined storm and high tide caused severe flooding of the Shoalwater Bay Reservation shoreline and the surrounding community.

  The flooding prompted the initiation of a Corps of Engineers emergency flood protection planning process. As a consequence, in March 2001, the Corps of Engineers constructed a riprap flood berm along a small portion (1,700 feet) of the Shoalwater Reservation shoreline. This flood berm provides protection from direct wave attack and further shoreline erosion during combined storm and high tide events only to this portion of the Reservation shoreline, including the Tribal headquarters building.

- **February 2006 flooding**
- November 2007 Flooding
- December 2007 Flooding: Disaster Declaration

For the 2006 and 2007 events, The USACE noted that the flooding on the Reservation was due to breaching of the barrier dune on Graveyard Spit that fronts the Tokeland Peninsula.

- The FEMA/NOAA Historical Flood Impact Tool[15] indicates eight (8) flooding events in Pacific County since 1996, including an event in 2012, and two in 2015. It is not known the impact the most recent events had on the Reservation.

There have been no reports of floods affecting the Shoalwater Bay Tribe since the last plan update in 2014, although tribal staff has noted there have been extreme storm surges and tides during this period that did not breach the berm.

PROBABILITIES OF FUTURE EVENTS

Floodplain maps updated indicate less impact from coastal flooding than previous FEMA floodplain maps.

Potential sea-level rise would increase exposure to coastal floods.

[14] Pacific Co FIS, p. 6

[15] https://www.fema.gov/data-visualization-floods-data-visualization

The biggest potential impacts from future coastal flooding are from the following sources:

- Continued coastal erosion to Graveyard Spit, Washaway Beach
- Sea level rise from climate change related global warning
    - Median probability by 2039: 0.2 feet, likely range = 0.1-0.3 ft
    - Median probability years 2090 – 2109: 1.6ft , likely range: 0.9-2.4 ft
- Land subsidence from an offshore Cascadia earthquake.

  "Based on the deformation model for the Cascadia L1 scenario **Tokeland Peninsula has 2.3-2.6 meters (7.5-8.5 feet) of subsidence**. The amount of subsidence from the next subduction zone event will vary depending on the severity of the earthquake, however in the 3,500 year land based record of earthquake subsidence the largest preserved event only approached 1.75 meters (5.7 feet). Thus the modeled value of 2.6 meters would be a conservative value and appropriate for planning purposes"[16].

DESCRIPTION OF IMPACTS, SUMMARY OF VULNERABILITY

IMPACTS

Revised FEMA flood maps show minimal impacts from coastal flooding. The 3000ft berm near the Tribal Center has protected the Reservation from flooding and storm surge, although on extreme occasions some water and debris may overtop.

Repairs and nourishment the dune berm on Graveyard Spit in 2018 has also reduced the impacts from storm surge.

HAZUS-MH modelling indicated 4 structures exposed to a 500-year flood event: 2 homes on Toke Point, 1 home on Shoalwater Bay Drive closest to Tokeland Rd., and the Tradewinds Hotel meeting hall. Of a combined $1.078 M in exposed assets, HAZUS estimates about $180,000 in damage to the structures and contents. This estimate may not be accurate due to low level of detail on flood depth grids used for modelling.

VULNERABILITY

The Shoalwater Bay Tribe will remain vulnerable to coastal flooding and storm surge if current mitigation efforts are not sustained.

Longer-term, the Tribe's vulnerability will decrease as the Tribe moves its development to higher ground. This would also mitigate its vulnerability to increased flooding rom coastal erosion, sea-level rise and land subsidence.

[16] Communications with D. Ungard, LG, WA Geological Survey, Dec. 2018

The Tribe also plans to remove the levee at Kindred Island, restoring the natural salt marsh habitat, but may also increase vulnerability from storm surge from the Kindred Slough marsh areas.

Vulnerability could increase due to four potential future conditions:

- **Continued erosion of Graveyard Spit and/or lack of monitoring and maintenance of beach barrier berm.** Although the additional beach barrier dune at Graveyard Spit)built in 2013) was successful in reducing storm surge, a strong El Nino year in 2015/16 severely damaged and breached the berm, increasing flood risk for the Reservation. It was repaired and hardened in 2018. The U.S. Army Corps of Engineers estimates that the dune berm will be need to be re-nourished with sand at least every five years to maintain protection to the Reservation.

- **Deterioration of berm near Tribal Center.** The USACE-constructed berm provides the main barrier of protection from storm surge and coastal flooding. The initial 1,700 foot long was originally constructed in 2001 to protect the Tribal Center and other tribal development from flooding similar to that caused by the 199 flood. The berm was expanded by 300 feet in 2007.

  Long-term the berm will need to be maintained. It may also need to be expanded to protect against changing conditions, such as increased coastal erosion, sea-level rise or land subsidence from an earthquake.

- **Sea-level rise**
  Geological condition cause the coastal area of Washington, including the Shoalwater Bay reservation, to slowly rise. This potentially mitigates from extreme sea-level rise that other areas may encounter but does not eliminate vulnerability. Estimated Sea-level rise with median probability ranges up to 2.4 feet. Newly adopted FEMA flood maps depict flood zones 3 feet above the official 100 year floodplain. This data indicates that no tribal assets are exposed at this time. Nonetheless storm surge and debris overtopping the berm may increase during storms combined with high tides.

- **Land subsidence**
  Following a Cascadia earthquake, the land may drop by as much as 8.5 feet. This would catastrophically change the Tribe's vulnerability to flooding, as subsidence this extreme would typically inundation all the Tribe's coastal assets during high tide. Even a lesser land subsidence would increase the Tribe's vulnerability to flooding during high tides, as well increased impacts from storm surge.

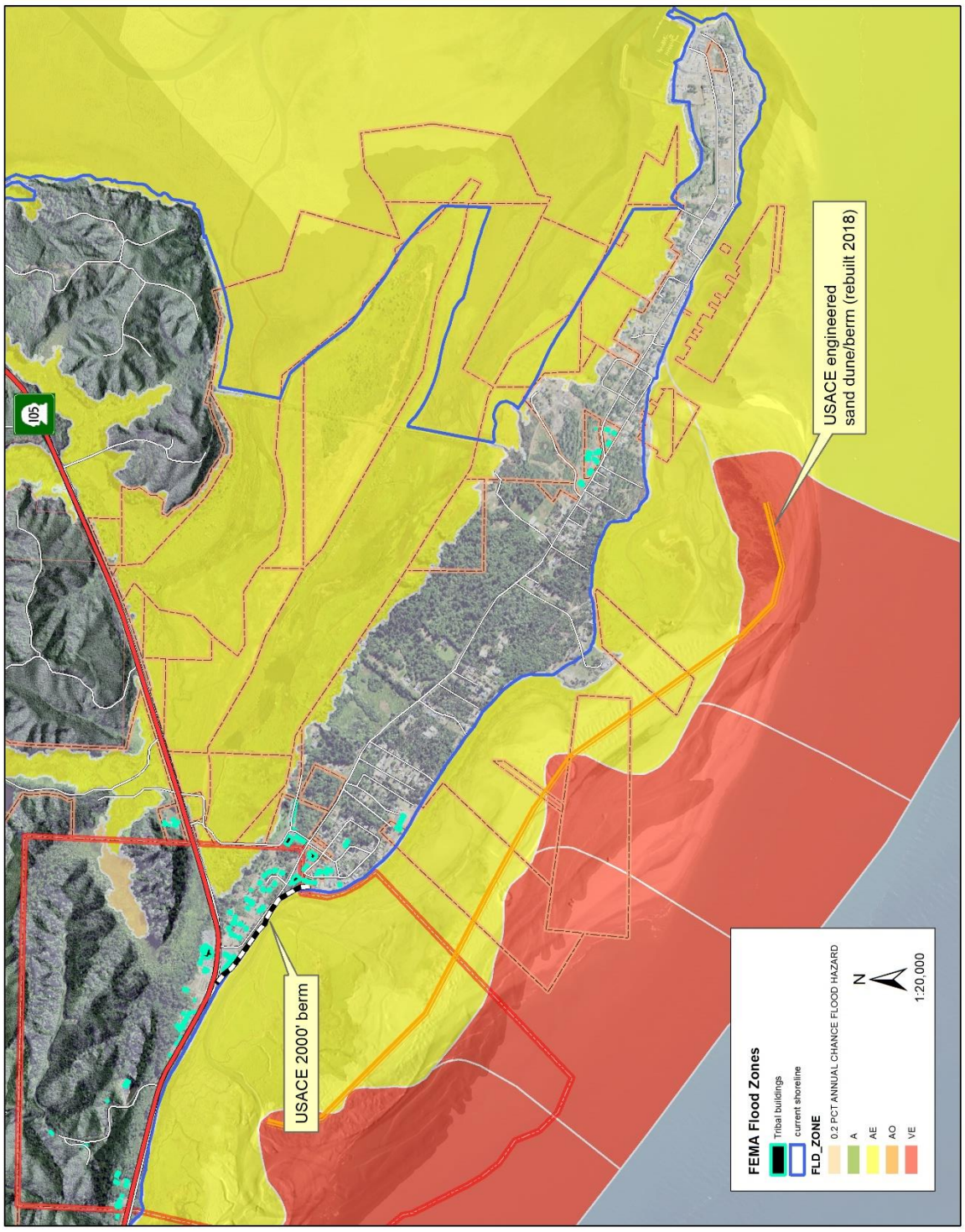


Figure 30: FEMA Flood Zones

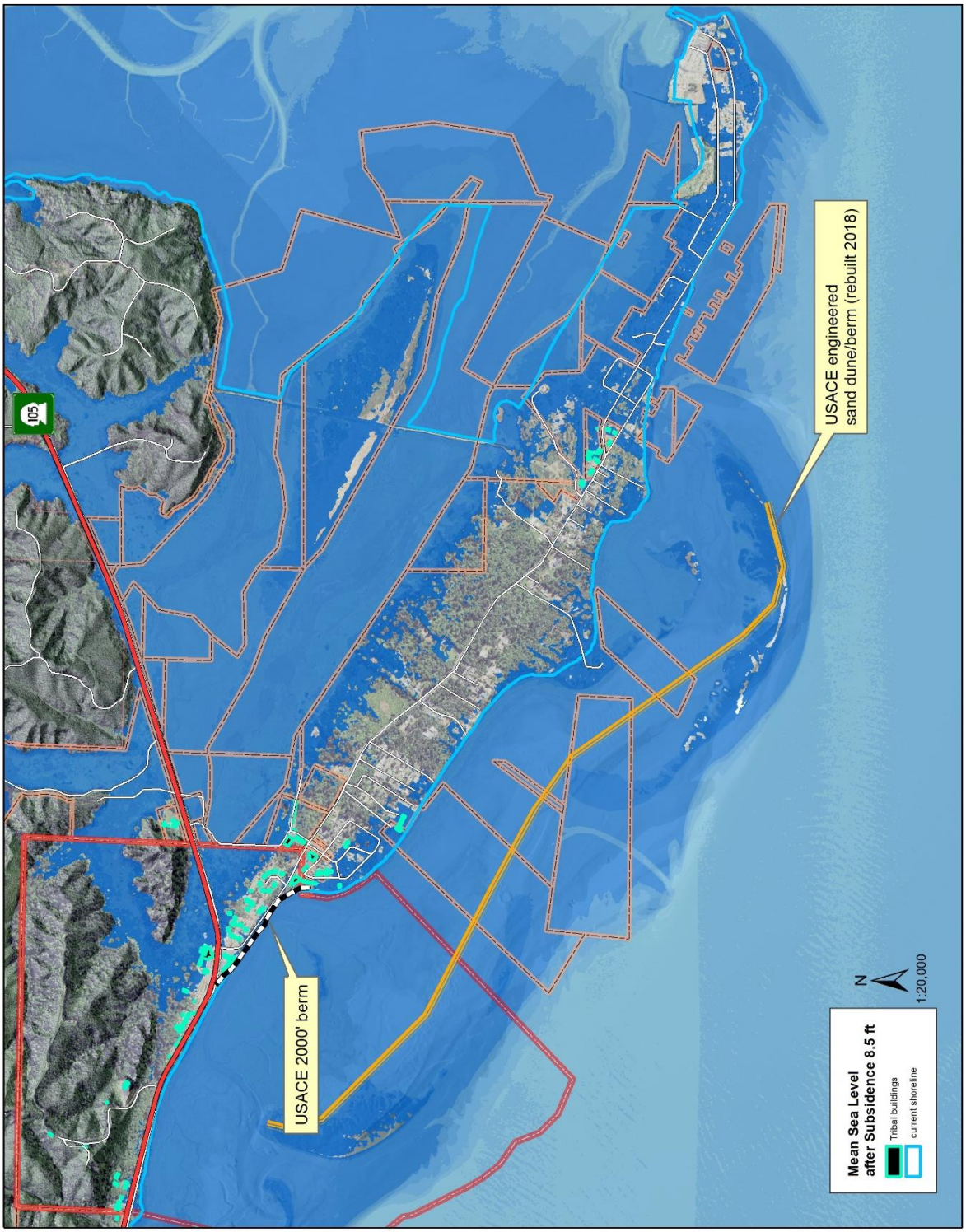


Figure 31: Mean Sea Level after EQ subsidence of 8.5 ft

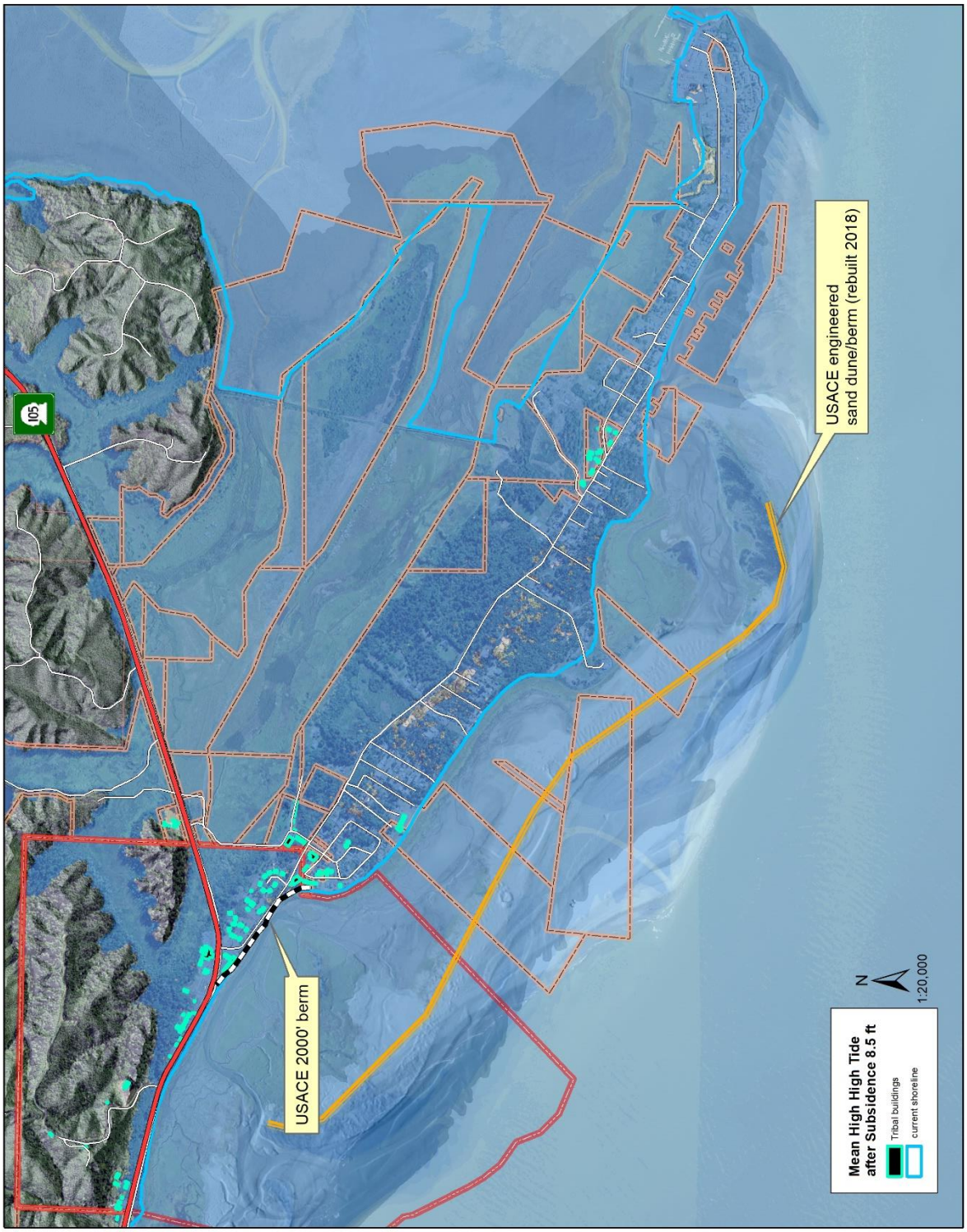


Figure 32: Mean High High Tide after EQ subsidence of 8.5 ft.

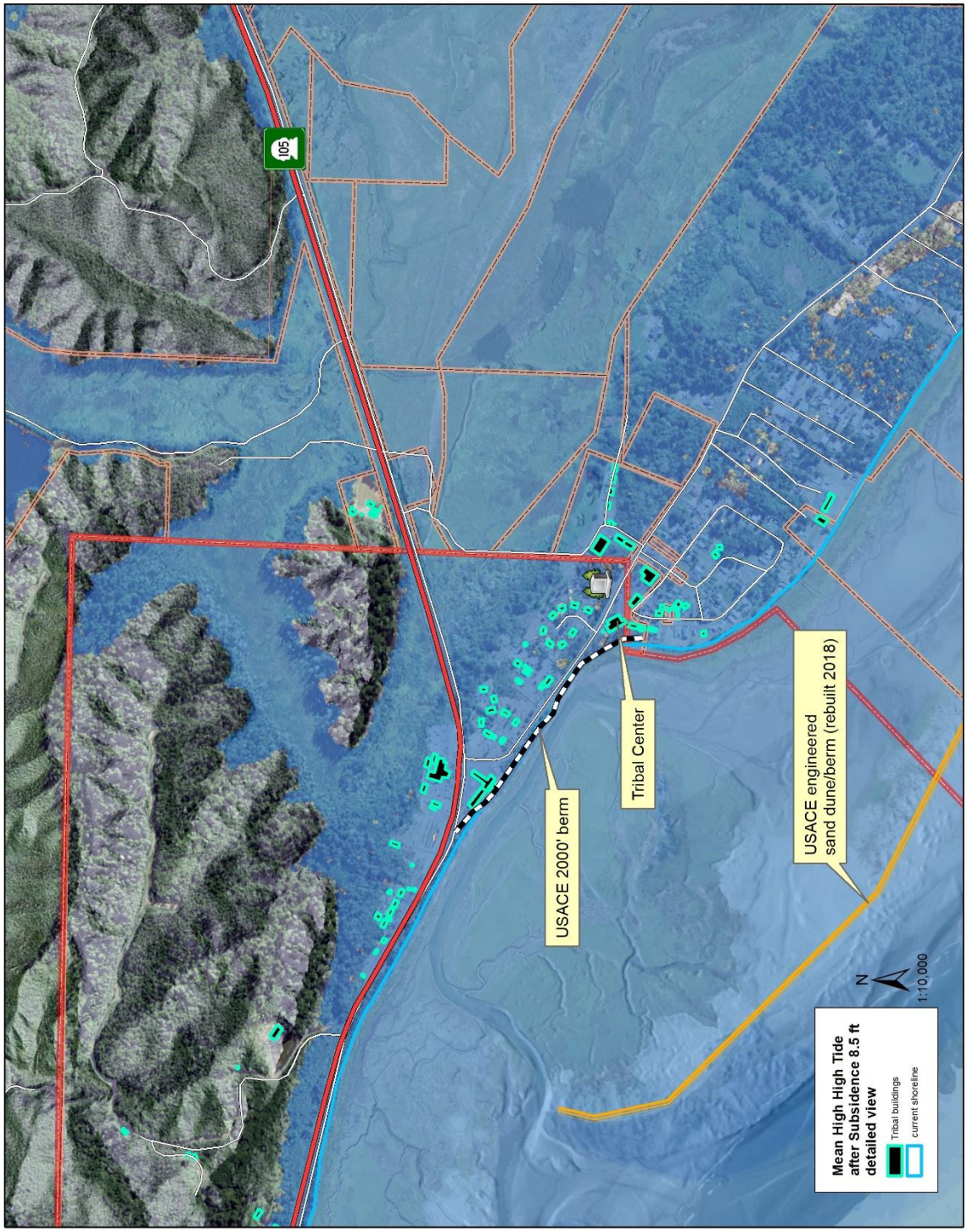


Figure 33: Mean HH Tide after EQ Subsidence of 8.5 ft - Detail

LANDSLIDES

LOCATION AND EXTENT

A landslide is the movement of rock, soil and debris down a hillside or slope.

The Shoalwater Bay Tribal lands are located in the SW Washington landslide province, one of the six landslide provinces of Washington State:

The primary characteristics of this landslide province are the lack of glaciation and localized exposure to glacial melt waters. In places, weathering processes exposed surfaces in this province for millions of years. Much of the province has deeply dissected terrain, with gentle slopes uncommon.

- **Earth flow** – This is the dominant form of landslide in the province. Both ancient and active earth flows are common, not only in the high and steep terrain, but also in the low, rolling hills of the Chehalis-Centralia area. Stream erosion along the toes of the flow usually causes reactivation of these landslides. Excavations, such as those for freeway construction, also may reactivate dormant earth flows or start new ones.
- **Debris flow** – These types of landslides are locally a problem in the western Cascades and Olympic mountains; they tend to occur where the rocks are strong and relatively un-weathered. These rocks tend to have steep slopes and smooth surfaces overlain by thin soils. Intense rainstorms, or rain on the wet snow in the mountains trigger these landslides.

Although the developed areas of the Shoalwater Bay Indian Reservation are on the flat coastal plain, the northern part of the Reservation is made up of steep hills subject to landslides. Eagle Hill Road and the Potable Water system are in this area. Future development of tribal lands in the hills may cross or be near landslide hazard areas.

Landslide hazards are not officially mapped for the Shoalwater Bay Tribal area. To identify potential landslide hazard areas, Pacific County's landslide hazard areas, as defined in its Critical Areas Ordinance[17] which includes slopes greater than 40%, and rock falls on slopes greater than 80%, were mapped using GIS lidar data.

[17] https://www.co.pacific.wa.us/ordres/Ord%20180.pdf p.64

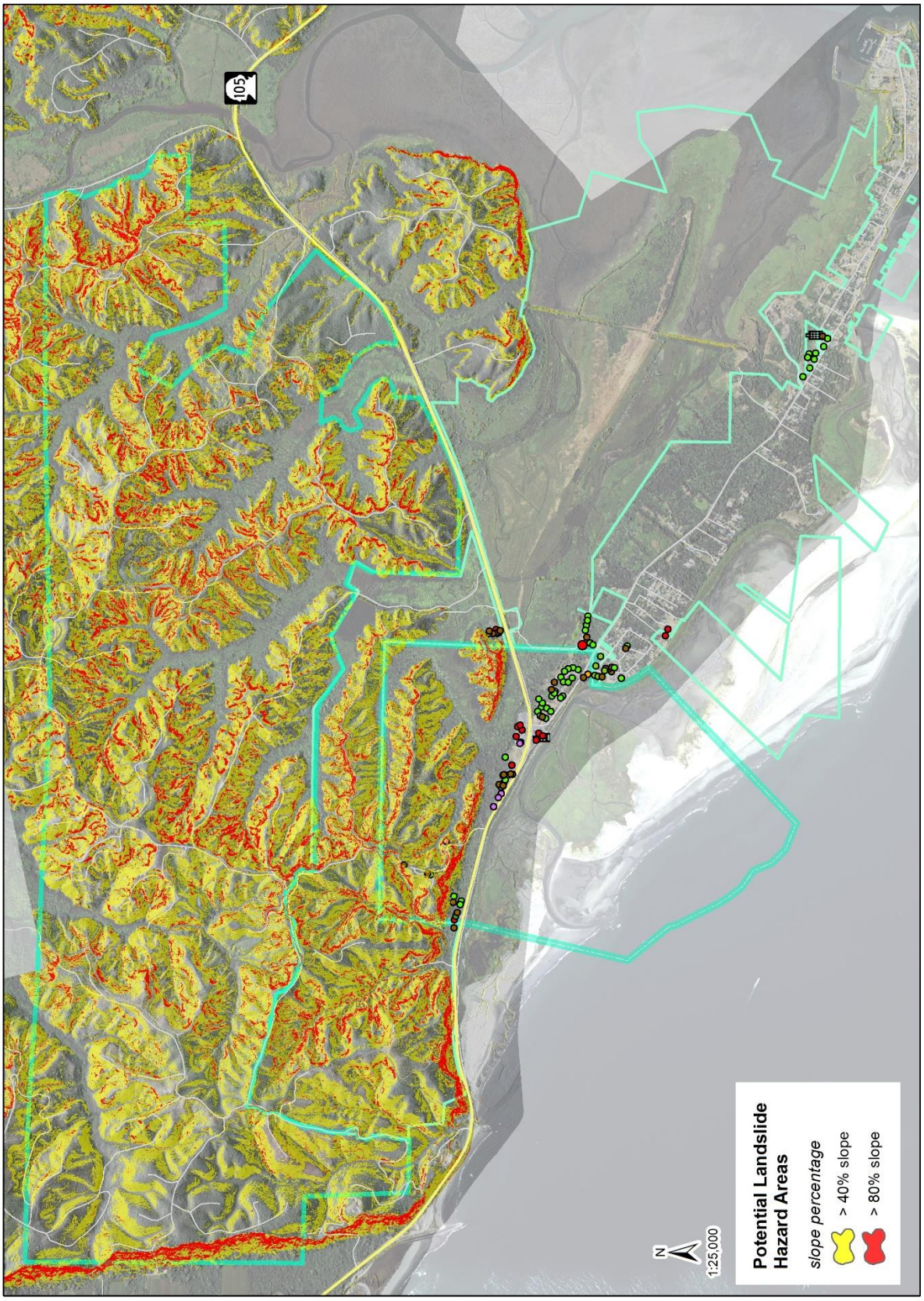
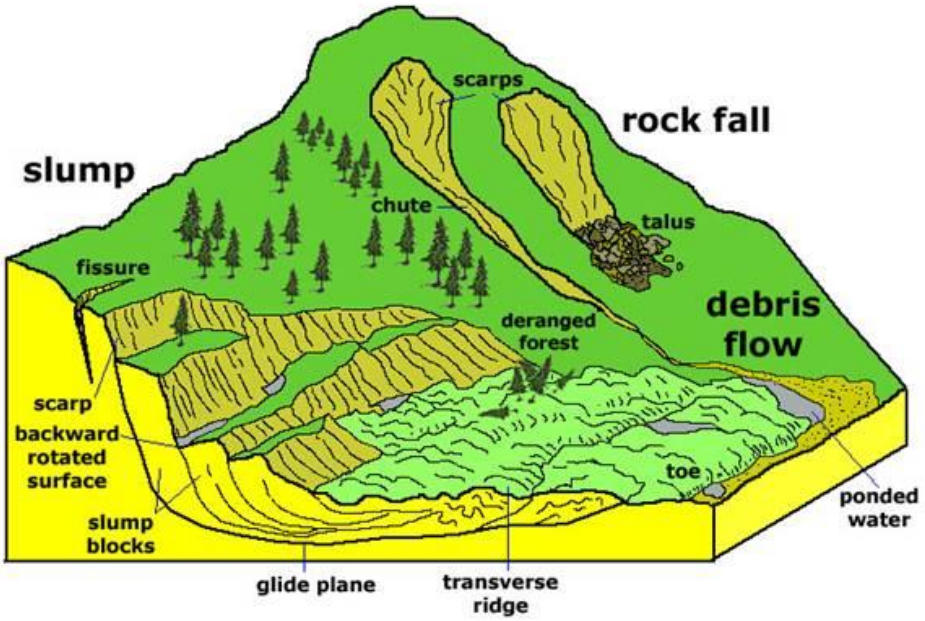


Figure 34: Landslide Hazard Areas (Slopes > 40%)

Figure 35: Types of Landslides



PAST EVENTS AND PROBABILITIES OF FUTURE EVENTS

PAST EVENTS

There have been no significant landslides recorded in the tribal planning area or region. It has been noted that minor mudslides and debris flows have affected the Eagle Hill Road area, but nothing causing any damage.

PROBABILITIES OF FUTURE EVENTS

Determining the probability of future landslide events is difficult determine as usually a record of past activity in an area determines the probability of future activity. The tribe's planning area and surrounding Pacific County has a minimal record of past landslides. Landslides are often triggered by other natural hazards such as earthquakes, heavy rain, floods or wildfires. Thus the probability of a landslide is related to the probability of future earthquakes, heavy rain, floods, and wildfires, in combination with areas of steep slopes.

DESCRIPTION OF IMPACTS, SUMMARY OF VULNERABILITY

IMPACTS

Impacts to the Tribe from landslides are minimal. Small landslides could block Eagle Hill Road, or worse case, affect the Tribe's water tower. No structures would be affected. Worse case damage loss to the Water tower and related infrastructure is approximately $400,000, in addition to costs from temporary loss of water supply.

VULNERABILITY

The Tribe's main vulnerability to a landslide is in conjunction with an earthquake and tsunami. Eagle Hill Road has a history of landslides, and a landslide following an earthquake, blocking and/or damaging the road, would hinder evacuation from a potential tsunami.

The tribe is also vulnerable to landslides that could block SR 105 outside of its tribal lands and which the tribe has no jurisdiction over. Landslides on SR 105 could prevent access to and from the Reservation, which would also be a concern following a major earthquake/tsunami.

Climate change may also increase rain and drought, as well as wildfire risk, which could lead to increases in landslides and unstable slopes.

Future development may also increase impacts from landslides. As the Tribe acquires the hills and uplands to relocate development away from tsunami hazard areas, the risk of development in or near landslide hazard areas increases. As the Tribe develops new structures, it must also build with landslide risks in mind and mitigate appropriately.

SEVERE WEATHER

LOCATION AND EXTENT

"A hard rain all the last night we again get wet the rain continues at intervales all day. Wind verry high from SW and blew a storm all day ...and our situation is truly a disagreeable one."

--- William Clark, Lewis & Clark Expedition, Monday, Nov. 11, 1805

Severe storms hit Washington's coast during the fall and winter, bringing heavy rains, strong winds, and high waves. Storms blow in about 70 to 100 inches of rain per year, the heaviest precipitation on the continent north of Guatemala. Coastal storm winds regularly top 40 miles per hour. The annual peak speed of 55 miles per hour can topple chimneys, utility lines, and trees.

The Shoalwater Bay Indian Reservation is continually affected by severe storms every fall and winter. A major storm in December of 2007 led to a Presidential Declaration and cut off the Shoalwater Bay Tribe's electricity and water supply (which runs on electricity) for days. Communications and access to the area were also limited.

The Tribe's primary concern, although infrequent, is the possibility of tornados and hurricane –force winds as strong weather systems approach the coast. The highest gusts recorded in the area were 140-150 mph.

PAST EVENTS AND PROBABILITIES OF FUTURE EVENTS

PAST EVENTS

There is an extensive history of wind storms and related storm surges over the last century. Significant events, particularly those affecting the tribal lands include:

- October 12, 1962 – The Columbus Day Wind Storm
- December 1996 - January 1997 "Holiday Blast" Storm
- January – March 1999 – La Niña Winter Windstorms
- November 11-12th, 2007 Windstorm, numerous trees down around Reservation and Tokeland Peninsula. Power out to the Tribe. See Figure 36 and Figure 37 at the end of this Section.
- Tornado warning in Tokeland area – October 12, 2016

Tribal staff also noted that there were two tornado warnings in the Tokeland area in 2019.

Also of note is that El Niño weather cycles caused erosion and flooding to the Reservation in 1997/98 as well as 2015/16, which led to the initial development of the berm at Shoalwater Bay Reservation, as well as the subsequent rebuilding of the berm/barrier beach (initially built in 2013) on Graveyard Spit in 2018.

The NOAA Storm events database records 92 events in Pacific County since 2015.

Figure 36: Tree on Powerlines at Tribal Center, Nov 11, 2007[18]

[18] Photo by Todd Ellingburg

Figure 37: Tree Down, from Different Angle, Nov 11, 2007[19]

PROBABILITIES OF FUTURE EVENTS

The probability of future hazard events can be measured by frequency of high winds, since severe weather can occur every year, predominately in the fall/winter.

- **Wind speeds exceed:**
  55 mph every year
  76 mph every 5 years
  83 mph every 10 years
  92 mph every 25 years
  100 mph every 50 years
  108 mph every 100 years

EL NIÑO RELATED EVENTS

El Niño is a recurring ocean-atmosphere phenomenon. Along Washington's coast, strong El Niños can bring extreme waves from the south-southwest, more frequent severe storms, increased sea levels, above average river flows, warmer than normal water temperatures, flooding, and erosion.

El Niño occurs every two to ten years.

[19] ibid

DESCRIPTION OF IMPACTS, SUMMARY OF VULNERABILITY

IMPACTS

Due to the long and frequent history of dealing with severe weather and wind storms, the impacts from severe weather are minimal and mitigated to a level the Tribe is satisfied with. Severe weather can knock down trees and powerlines, knocking out power and communications, as well as damage structures. Strong winds may also affect older structures and/or those that have not had mitigation efforts in place.

Although damage estimates have not been prepared, extreme events can still potentially affect all of the Tribe's people, property and buildings.

Mitigation is in place to prevent storm surge related flooding, but further monitoring and replenishment of the beach barrier berm on Graveyard Spit needs to occur, or impacts will increase such as coastal storm surge and related flooding and debris.

The Tribe has not mitigated for extreme winds, such as those from tornadoes, and will focus its efforts on minimizing the impacts from those type of events.

VULNERABILITY

The Tribe's vulnerability to severe weather and related storm surge has been greatly reduced by the development of the protective berm along the coastline and the barrier beach berm at Graveyard Spit. Mitigation efforts to harden tribal facilities from strong winds have also reduced vulnerability.

The Tribe is still vulnerable to extreme wind events, such as tornados, and is seeking to develop mitigation efforts, such as storm shelters and safe rooms, to reduce this vulnerability.

Climate change could potentially increase the Tribe's vulnerability. Sea-level rise could increase storm surge and/or destroy and/or reduce the effectiveness of the storm berms and beach barriers in place. The tribe is also dependent on federal funding and support to monitor and maintain the berms.

Increased severe weather could lead to more frequent high wind events, including tornadoes, for would increase need for additional mitigation efforts to adapt current and future structures to these scenarios.

Historic village/camp and other cultural sites are also at risk of increased erosion from storm surge and sea-level rise as result of increased severe weather.

TSUNAMI

LOCATION AND EXTENT

A tsunami is a series of extremely long waves caused when an event, such as an earthquake, suddenly shifts water in the ocean or in a lake. A tsunami radiates outward in all directions from its source and can move across entire oceans in less than a day.

The Shoalwater Bay tribe can be impacted by two types of tsunami:

Table 7: Types of tsunamis that can impact Tribe

Type of tsunami	Description	Area of greatest impact	Time to evacuate
Distant	A tsunami is created by a distant earthquake or landslide and travels across the ocean	Pacific coastal communities	Hours
Cascadia subduction zone	Tsunami created by large Magnitude 8–9 earthquake off the Washington, Oregon, or British Columbia coasts	Pacific coastal communities	Tens of minutes

Recently updated data and modelling indicates the potential exposure of the Shoalwater Bay Reservation. Using a 9.0 Cascadia Subduction Zone earthquake off of the coast of Washington as a worst-case scenario, models indicate that all of the Tribe's people, property and lands below 40-50 feet elevation would be significantly impacted by tsunami inundation and high velocity waves.

PAST EVENTS AND PROBABILITIES OF FUTURE EVENTS

PAST EVENTS

While tsunamis have caused significant damage, deaths and injuries elsewhere in the world, only one significant tsunami struck Washington's Pacific coast in recent history.

The 1964 Alaska earthquake generated a tsunami that resulted in more than $640,000 (in 2004 dollars) in damage. However, geologic investigations, combined with Native stories and other historical records, indicate that tsunamis have struck the coast a number of times over the last few hundred years.

1700 CASCADIA TSUNAMI

The most recent Cascadia Subduction Zone earthquake, estimated M 9, occurred at January 26, 1700 at about 9 PM PST. The subsequent tsunami overran Native fishing camps and villages and triggered

landslides that also destroyed some villages. Many native village sites were abandoned or relocated after this event.

The land also subsided by a few feet after the earthquake, covering the lands with tsunami deposits as the tides overtook formally dry upland.

"… there was a big flood shortly before the white man's time,

… a huge tidal wave that struck the Oregon Coast not too far back in time …

the ocean rose up and huge waves swept and surged across the land.

Trees were uprooted and villages were swept away. Indians said they tied their canoes to the top of the trees, and some canoes were torn loose and swept away.

… After the tidal wave, the Indians told of tree tops filled with limbs and trash and of finding strange canues in the woods. The Indians said the big flood and tidal wave tore up the land and changed the rivers. Nobody knows how many Indians died.

-- Beverly Ward, recounting stories told to her around 1930 by Susan Ned, born in 1842.[20]

1960 CHILEAN TSUNAMI

A magnitude 9.5 earthquake along the coast of Chile generated a tsunami that struck the Washington coast at Grays Harbor (small waves), Tokeland (two feet), Ilwaco (two feet), Neah Bay (1.2 feet), and Friday Harbor (0.3 feet). No damage occurred.

1964 ALASKAN TSUNAMI

The tsunami generated by the March 27, 1964 Alaska earthquake was the largest and best-recorded historical tsunami on the southern Washington coast. Tsunami wave heights generally were greatest on the south coast and smaller on the north coast; additionally, the tsunami was recorded inland in the Strait of Juan de Fuca (Friday Harbor), Puget Sound (Seattle), and the Columbia River (Vancouver).

Observations were made of the tsunami in Grays Harbor County at Westport, Joe Creek, Pacific Beach, Copalis, Grays Harbor City, and Boone Creek.

Damages included debris deposits throughout the region, minor damage in Ilwaco, damage to two bridges on State Highway 109, a house and smaller buildings being lifted off foundations in Pacific Beach (the house was a total loss), and piling damaged at the Moore cannery near Ilwaco.

[20] https://pnsn.org/outreach/native-american-stories/dating-the-1700-cascadia-earthquake

Table 8 Recorded Height of Tsunami Waves from 1964 Alaska Earthquake

Wreck Creek	4.5 meters	Neah Bay	0.7 meters
Seaview	3.8 meters	Taholah	0.7 meters
Moclips	3.4 meters	Hoh River Mouth	0.5 meters
Ocean Shores	2.9 meters	Friday Harbor	0.4 meters
La Push	1.6 meters	Vancouver	0.1 meters
Ilwaco	1.4 meters	Seattle	0.1 meters

NOVEMBER 2006 TSUNAMI

On Nov 15, 2006, a magnitude 8.3 earthquake occurred near the Kuril Island northeast of Japan. Washington was put into a Tsunami Advisory which resulted in a 5 cm tsunami that was reported on the Neah Bay tide gage. However, after the cancellation of the Tsunami Advisory, a train of tsunami waves hit Crescent City, California six hours after the earthquake and destroyed docks, tore about a dozen boats lose from moorings, and sank at least one boat.

Table 9 Recorded Height of Tsunami Waves from 2006 Kuril Island Earthquake

La Push	0.15 meters
Neah Bay	0.3 meters
Port Angeles	0.11 meters
Westport	0.04 meters

MARCH 2011 TOHOKU EARTHQUAKE

The March 11, 2011 magnitude 9.0 Tohoku, Japan earthquake (38.297 N, 142.373 E, depth 29 km) generated a tsunami observed over the Pacific region and caused tremendous local devastation as the impacts were experienced over a large area. While the tsunami did not cause any damage within the planning area, there was slight increased waive activity as a result of the earthquake, as well as debris found along the beaches of Pacific County for a few years after.

Table 10: Recorded Height from tsunami waves from 2011 Tohoku Earthquake

La Push	0.7 meters
Neah Bay	0.43 meters
Port Angeles	0.58 meters
Port Townsend	0.15 meters
Westport	0.45 meters
Toke Point	0.33 meters

PROBABILITIES OF FUTURE EVENTS

The 1700 Cascadia Earthquake/Tsunami is the modelled event for future scenarios, and similar M 9.0 megaquakes are estimated to recur every 500-600 years.

DESCRIPTION OF IMPACTS, SUMMARY OF VULNERABILITY

IMPACTS

The impacts from a tsunami, especially from a modelled Cascadia 9 Event, would be catastrophic.

In addition to the previous damage from the earthquake, a tsunami would destroy all of the Tribe's buildings and infrastructure except for the shelter and houses on Eagle Hill Rd. The depths of the waves would overtop most structures, and the overall velocity of multiple waves, combined with ocean and nearshore/beach debris, would most likely destroy any remaining buildings. Foundations will remain, but roads will be filled with debris and all wired communications and power lines will be destroyed.

After the final waves of the tsunami stop, a new situation becomes apparent – a land that dropped 8.5 feet, meaning that the highest tides now lap along the base of the hills as they inundate most of the property of the Tribe along SR 105 and Tokeland Rd. including the Tokeland peninsula, with low tide now considered similar to high tide before the earthquake.

VULNERABILITY

The Shoalwater Bay Tribe is one of the most vulnerable communities in the United States to the impacts from tsunami. Apart from an evacuation shelter built on Eagle Hill road, all the tribe's people, visitors, infrastructure, buildings and businesses are located at sea-level on the coastal plain.

Limited evacuation routes and staging areas also increases vulnerability. Evacuation is further hindered by the fact that the first tsunami waves could reach the Reservation within 30 minutes.

The community would already be impacted by the earlier earthquake, which could potentially cause massive property damage, injuries and debris, and hinder subsequent response, rescue and evacuation efforts.

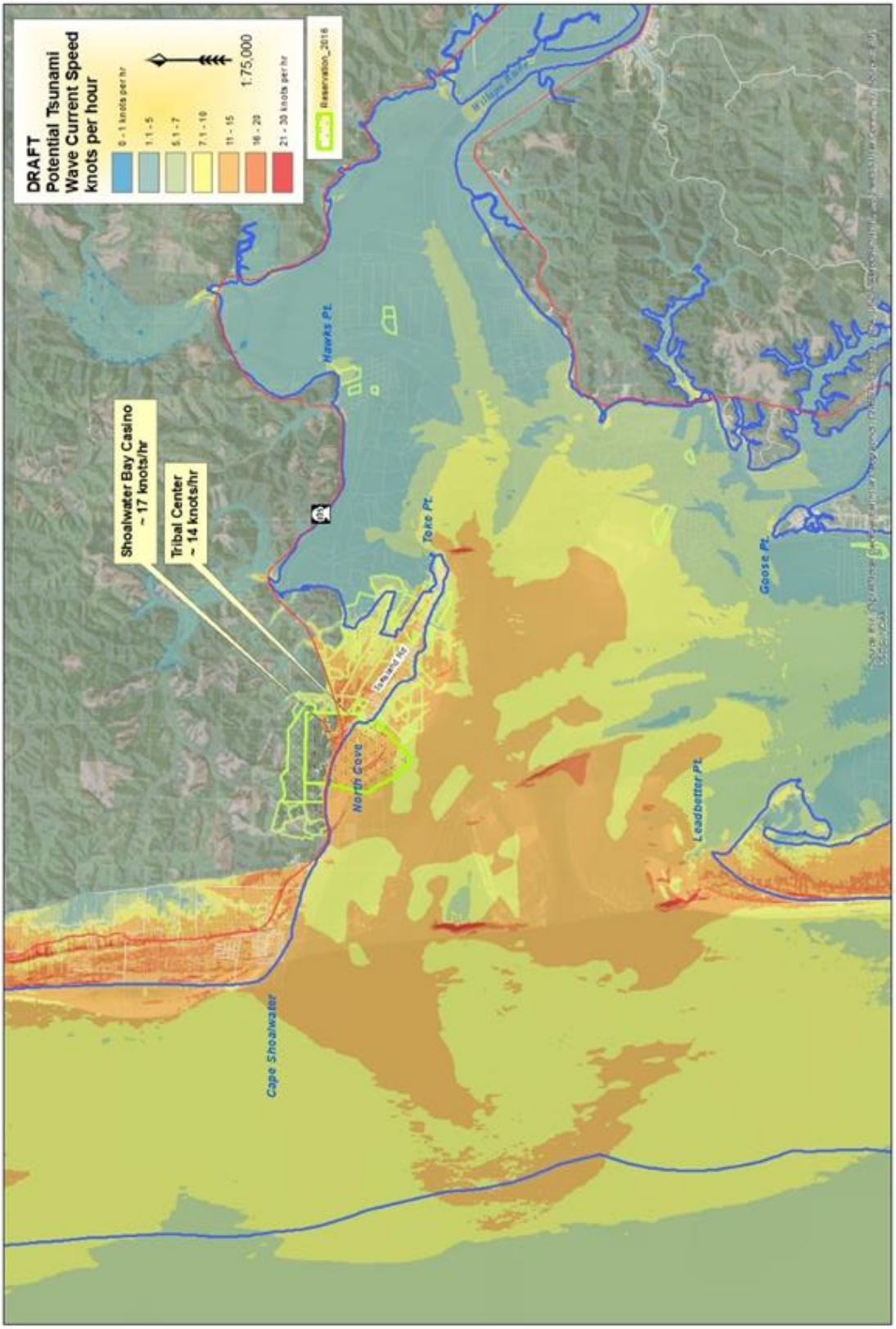


Figure 38: Tsunami Wave Velocity

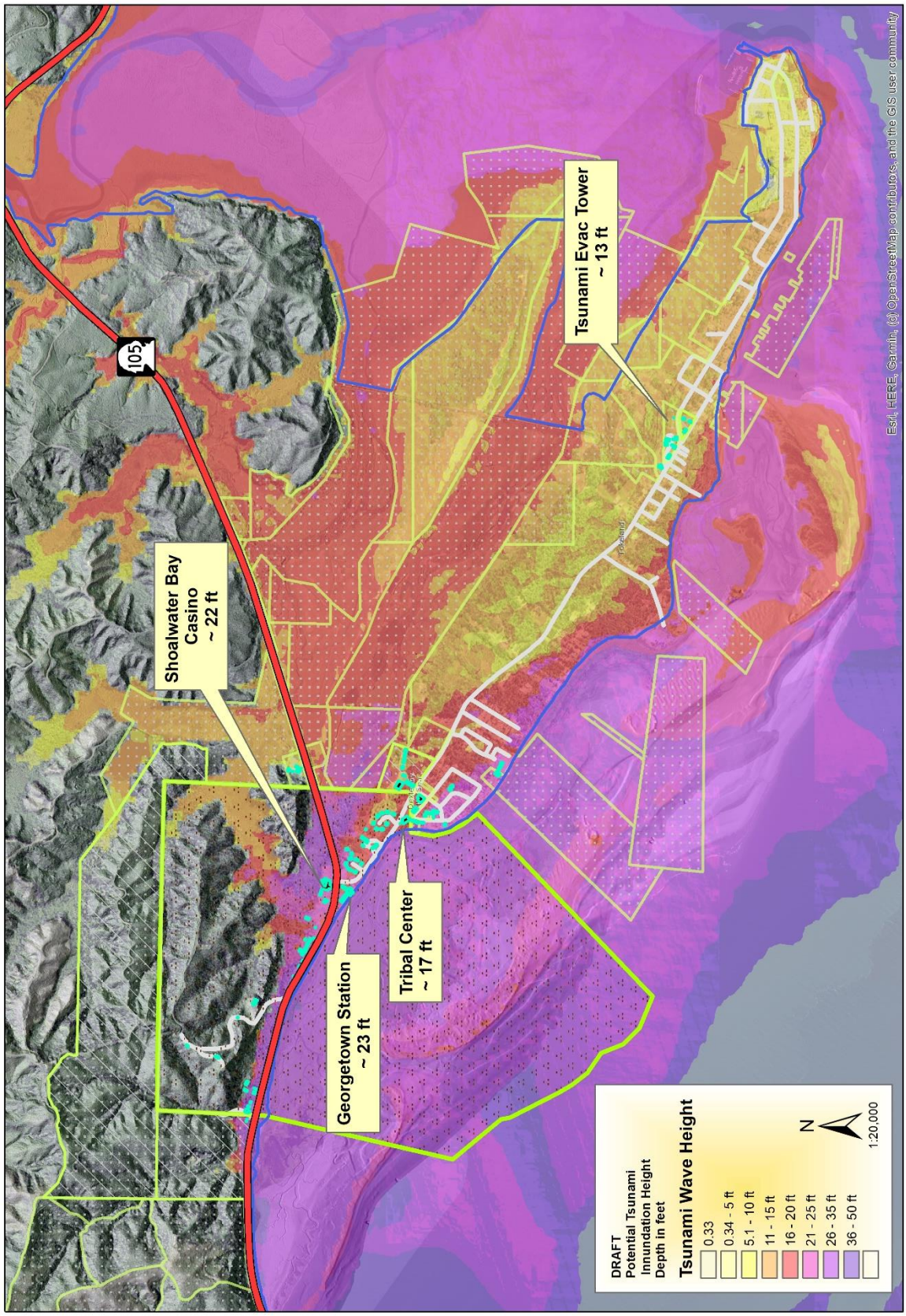


Figure 39: Tsunami Inundation Height

WILDFIRES

LOCATION AND EXTENT

Wildland fires are fires caused by nature or humans that result in the uncontrolled destruction of forests, brush, field crops, grasslands, and real and personal property in non-urban areas.

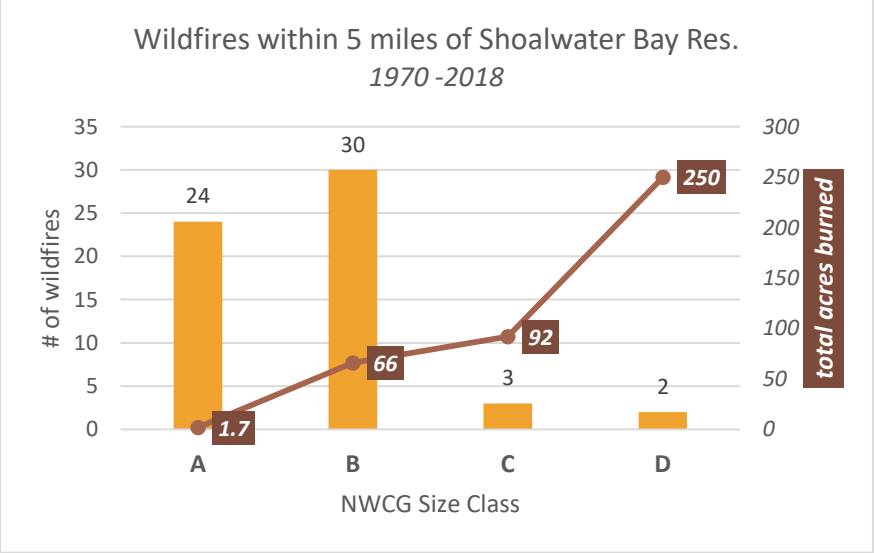
In Western Washington, wildfires generally occur during late spring and summer, ending when the rainy season begins October.

On the southwest Washington coast, wildfire risk is considered low. Although heavily vegetated, with a history of logging, the area's wet coastal climate leads to damp conditions that makes it difficult for wildfires to start naturally and spread.

The Wildfires that do occur tend to be small near the coast. The 59 past wildfires since 1970 analyzed within 5 miles of the Reservation, found that (excluding the top 4 largest fires, 29 acres or more) most fires burn on average 1.5 acres. Using the National Wildfire Coordinating Group size classification[21], almost half of past events were less than ¼ acre, or 24 events totalling 1.7 acres burned.

Almost all fires in the area are caused by humans, primarily by logging related debris burns, as well as by campers and other recreational activities.

Figure 40: Wildfires by Size



[21] https://www.nwcg.gov/term/glossary/size-class-of-fire

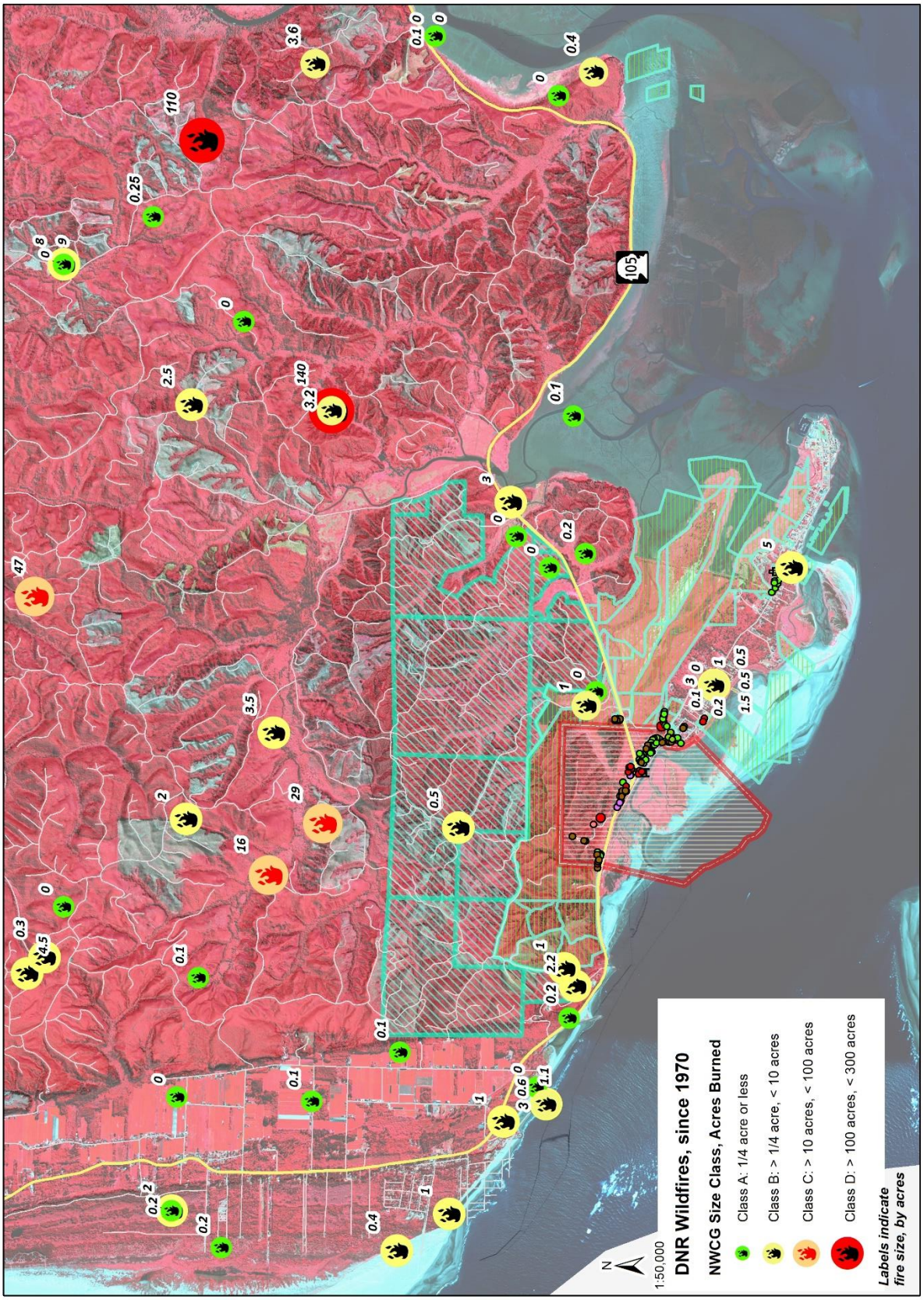
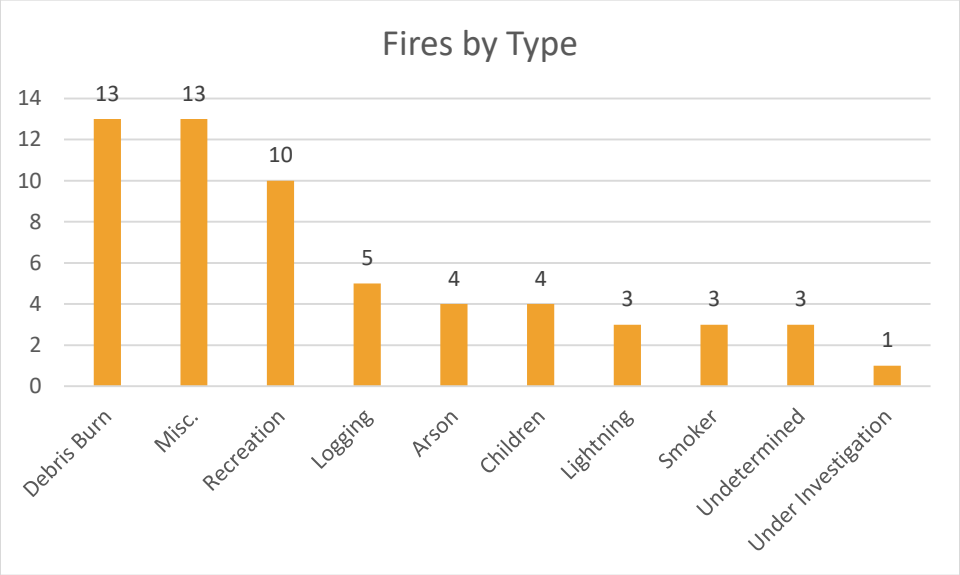


Figure 41: Wildfires, by size, near Shoalwater Bay Res. 1970-2019

Table 11: Past Wildfires by Type



PAST EVENTS AND PROBABILITIES OF FUTURE EVENTS

PAST EVENTS

Historically, there not been any major wildfires in the Shoalwater Tribal area or surrounding region. GIS analysis was conducted of past wildfire events using WA Dept. of Natural Resources GIS data. All events from 1970 (earliest GIS data) to 2019 were identified and analyzed within five (5) miles of the Shoalwater Bay Reservation.

There have been 59 events since 1970. There have been 10 events since 2008. The largest fire in the study area occurred May 24, 1982, which burned 140 acres on the hill east of the Cedar River. The most recent large event was the Independence Fire, which burned 110 acres just west of North River.

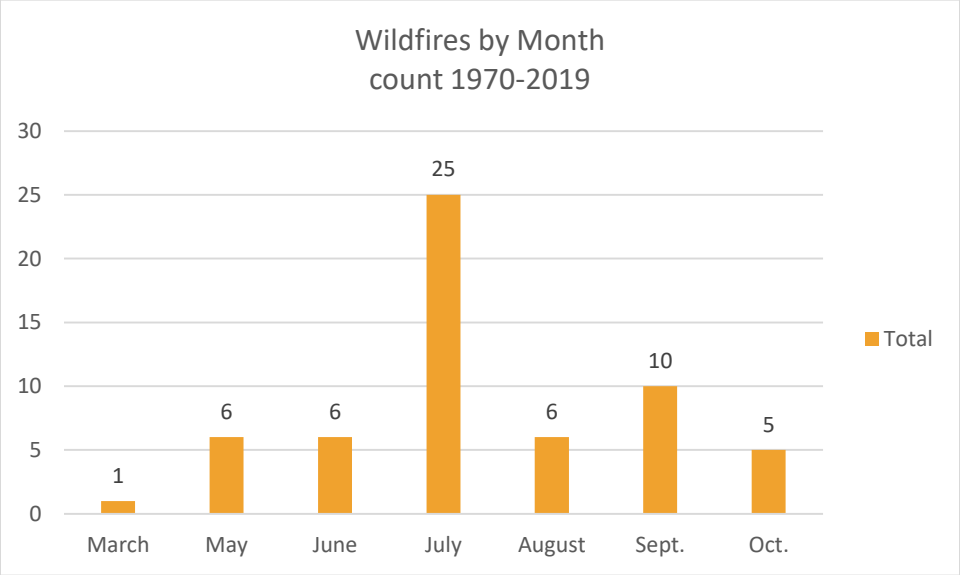
The most recent events occurred in 2019, a 0.3 acre fire on the Tokeland Peninsula, and a 0.1 acre brush fire in the salt marsh near the mouth of the Cedar River.

There have been 6 past events on Tribal properties, all on timberlands. There have been no past fires on the Reservation or tribal trust lands.

PROBABILITY OF FUTURE EVENTS

GIS analysis found that the Shoalwater Bay area can experience usually one wildfire every 1-3 years. May through early October is when wildfires occur, July being the most frequent month for events.

Table 12: Past Wildfires by Month



Climate change could bring an increase in number and severity of wildfires.

By 2069, the amount of "Extreme Fire Dangers" days in the area could increase by 6 days to 17 days per year, and the amount of "Very High Fire Danger" days could increase 47 days per year, and increase of 12 days.

DESCRIPTION OF IMPACTS, SUMMARY OF VULNERABILITY

IMPACTS

Impacts to the Tribe's assets are considered minor to moderate. A wildfire event would be small and most likely affect one or two structures before suppression. Larger structures, such as the Casino and Tribal Center are well protected and have fire suppression systems in place to minimize risk of spread. The tribe estimates that worst case, a fire could cause $500,000 in damage.

There is also concern of fires affecting the Tribe's natural resource areas, such as the salt marshes and beaches. Fires could damage and destroy critical native plants and habitats and speed up erosion.

VULNERABILITY

The potential for a large wildfire on the Shoalwater Bay Reservation is extremely low. Improved fire spotting techniques, better equipment, and trained personnel are major factors, as are the Reservation's wet climate and normally low fire fuel conditions.

Nonetheless, the Reservation is served by a small volunteer fire department which may take longer to deploy and fight the fire. Outside resources would also take a long time. The vegetation in the area is

composed of thick forests and logging debris or beach grasses and driftwood, both of which are potential fuel sources for wildfires.

Tribal members and staff are concerned with wildfires starting in the densely wooded hills behind the Reservation and spreading to nearby Tribal homes along SR 105. Staff also noted concerns with beach fires spreading onto tribal lands.

The main vulnerability is careless campers and hunters who could start fires that spread uncontrolled onto the Reservation, as well as errant or careless use of fireworks during the 4th of July holiday season.

CLIMATE CHANGE EFFECTS AND FUTURE DEVELOPMENT

Climate change is expected to bring hotter, drier summers (as well as wetter winters) to the Shoalwater Bay area. This could increase the fuels and conditions for increased number and sizes of wildfires.

The tribe's future development is vulnerable to these increased impacts from wildfire. Most new tribal development will be located in the hills above the current areas of coastal development. These hills are former timberlands, which will surround any new development and structures.

Mitigation actions will be identified and implemented by the Shoalwater Bay in order to reduce the risk of wildfires impacting these future developments.

ADDITIONAL HAZARDS AND THREATS

For planning requirement purposes, FEMA considers the scope of this tribal hazard mitigation plan to encompass the impacts and vulnerability to natural hazards. Natural hazards are generally defined as geological and climatic related hazards.

Specifically, under the Stafford Act, a **major disaster** means any natural catastrophe (including any hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm or drought), or regardless of cause, any fire, flood, or explosion in any part of the United States that the President determines causes damage of sufficient severity and magnitude to warrant federal assistance.

Although the impacts from **infectious disease outbreaks** (epidemics and pandemics)' **civil unrest and terrorism**, and **hazardous materials events** (oil spills, nuclear reactor meltdowns) can be more severe than natural hazards, and with longer recovery times, these events are generally not considered in hazard mitigation plans.

Natural hazards planning generally considers these hazards to be secondary impacts from geological and climatic events, even when they do not have a source from a geological or climatic event.

Nonetheless is it vital to be aware of these hazards and to recognize the Shoalwater Bay Tribe's exposure and vulnerabilities.

This section will review the following additional hazards:

- Infectious disease outbreaks
- Civil unrest and terrorism
- Hazardous materials spills

INFECTIOUS DISEASE OUTBREAKS

An infectious disease outbreak, whether a secondary effect of natural hazards, or spread from nature, can have devastating impacts on Native communities.

Specifically the Shoalwater Bay Tribe's ancestors in the lower Colombia River region were nearly wiped by epidemics in the late 18th century and throughout the 19th century, and possibly impacted by earlier outbreaks. The worst disease outbreaks include smallpox, malaria and measles. Epidemics of Influenza, dysentery, yellow fever, bubonic plague, typhoid fever, cholera and whooping cough also caused many deaths.

In more recent history, tribal communities continue to be amongst the vulnerable in the United States from epidemics and pandemics. Native Americans are at an extreme risk due high rates of health problems, like diabetes and heart disease, , a large elder population, also with a higher rate of health

needs, less funding and access to adequate medical care, and also cultural considerations that imparts a large role in family and tribal gatherings that can spread diseases.

COVID-19 PANDEMIC

As this hazard mitigation plan was being finalized, a new coronavirus, SARS-CoV-2, emerged in the United States in January 2020, with devastating impacts locally, nationally, and worldwide.

On March 22, 2020, the President approved a Major Disaster Declaration for the Washington State Covid-19 Pandemic, DR-4481[22].

It is not known at this time what impacts the pandemic will have on the Shoalwater Bay Tribe, but it is vital that the tribe be proactive in its efforts to mitigate this and future infectious disease outbreaks.

CIVIL UNREST AND TERRORISM

Although not a major threat or vulnerability for the Shoalwater Bay Tribe, impacts from civil unrest and terrorism can affect the Tribal community. In general, tribal communities have been impacted severely over the last few centuries from civil unrest and what is today referred to as terrorism.

There are numerous examples of racial massacres, rampart discrimination, criminal acts, and terroristic incidents against the native peoples of the Pacific Northwest. In the past decade, American-based right wing terror groups and sympathizers have emerged and gained power and visibility, with their targets often including tribal communities.

The Southern Poverty Law Center identified, as of 2019, at least 30 hate groups in Washington State, although none were identified as active in the Pacific County area[23].

The Shoalwater Bay Tribe must remain vigilant to threats from hate groups, especially as their cultural and economic reemergence and success, as well as role as a major employer in an area where Native-Americans make up only 3% of the local population, may breed resentment and anger amongst certain groups and individuals in the community.

HAZARDOUS MATERIALS RELEASES

Hazardous materials can cause widespread damage to people, property, and the natural environment. Hazardous materials can be released by a hazard event, such as an earthquake, flood, or even by severe weather (for instance, a truck accident during an icy winter storm).

[22] https://www.fema.gov/disaster/4481

[23] https://www.splcenter.org/hate-map?state=WA

Hazardous material spills may be the most deadly and dangerous secondary effect of natural hazards. That is why it is essential to identify all potential locations where hazardous materials may be spilled and what locations store hazardous materials on-site.

Overall, the Shoalwater Bay Tribe's impacts from hazardous materials spills are low and localized, and the Tribe's vulnerability is low.

The Shoalwater Bay has one potential hazardous materials site, the Georgetown Gas Station. There are underground gasoline storage tanks that could potentially rupture after an earthquake or tsunami, contaminating the local groundwater, North Cove, and surrounding marshes.

Additionally, during late June and up to the Fourth of July, many trial members sell fireworks on the Reservation along SR 105. There is also an area on SR 105 near the casino to light fireworks. This has the potential to explosive and/or release explosive/hazardous materials into the area.

Other threats include localized spills from vehicle accidents and household/business-sourced spills, which in large or multiple quantities (for example after an earthquake or tsunami) also affect the groundwater and local marshes.

Regionally, oil spills onto the coastline or into and within Willapa Bay is a major concern. Oil spills could occur from the sinking or grounding of a ship near the treacherous shoals offshore from the bay.

The WA State Department of Ecology maintains an oil spill **geographic response plan (GRP)** for the area around the Reservation and Willapa Bay[24]. The Willapa Bay GRP was last updated in 2003, but was scheduled for a review and update in 2019.

Geographic response plans have been created to guide the response and protection of valuable areas in case of a spill. There are six (6) strategies for the area around the Shoalwater Bay Reservation, and generally include the deployment of booms to block the entrance to marshes in the case of an oil spill.

[24] https://ecology.wa.gov/Regulations-Permits/Plans-policies/Contingency-planning-for-oil-industry/Geographic-response-plans-for-oil-spills

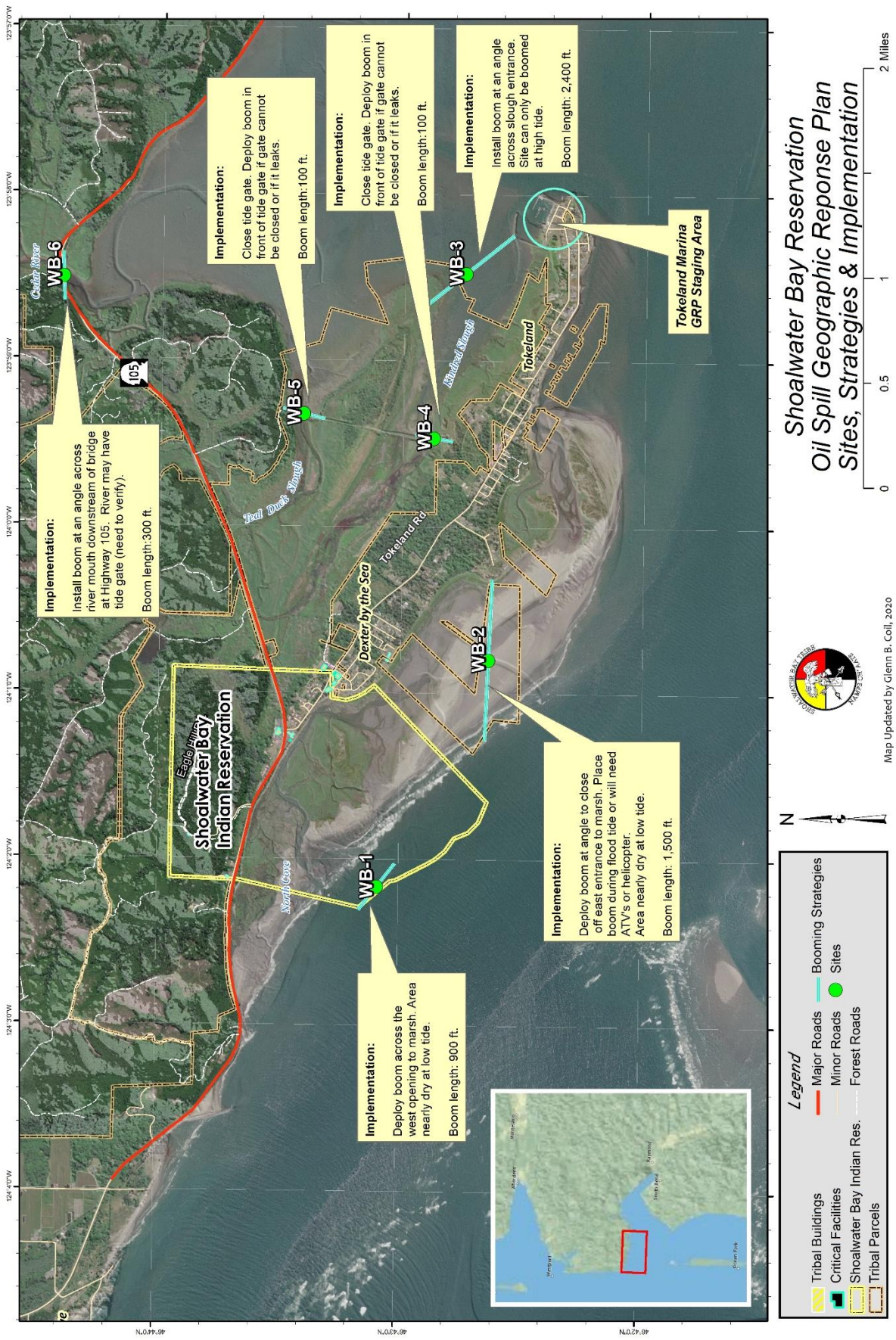


Figure 42: Tokeland area Oil Spill GRP

MITIGATION STRATEGY

The Shoalwater Bay Tribe's mitigation strategy serves as its long-term guide for action to reduce the tribe's potential losses and impacts from the natural hazards that affect the tribe.

For the 2019 plan update, this section was revised to meet FEMA tribal planning guidance, as well as to increase ease of use in implementation.

A comprehensive evaluation and update of the tribal government's existing authorities, policies, programs, and resources and its capability to use or modify these tools to reduce vulnerability from profiled hazards was conducted and included in this update.

PRE- AND POST-MITIGATION CAPABILITIES; EVALUATION OF LAWS, REGULATIONS AND DEVELOPMENT

The Shoalwater Bay Tribe in general, have limited capabilities in regards to pre- and post-disaster mitigation. Located in a rural, remote area of Washington State, the tribe has a small land base and population that limits the ability to increase its capabilities. Tribal laws, regulations and policies only cover tribal trust and reservation areas, thus limiting potential effectiveness. For its fee lands (private property), the tribe must adhere to Pacific County land use regulations and policies. In general, tribal funding comes from its business enterprises, primarily the Shoalwater Bay Casino, as well as from federal grants and programs. To a lesser extent, the tribe also a beneficiary of program and project funding from various Washington State agencies, such as Dept. of Ecology, Dept. of Heath, and the Emergency Management Dept.

Nonetheless, with these limited capabilities, the Shoalwater Tribe has emerged as a national model in leveraging its limited capabilities to work with local, county, state and federal partners on numerous hazard mitigation and disaster planning related projects and programs.

2019 UPDATE

For the 2019 plan update, the capability assessment from the 2014 plan was reviewed. Contractor worked with tribal staff to evaluate status of capabilities for the update, as applicable. It was determined during the evaluation to reformat the capability assessment to meet FEMA Tribal plan guidance and to streamline for clarity and ease of future review and update.

EXISTING CAPABILITIES

The Shoalwater Bay Tribe continues to expand and enhance its pre- and post-disaster hazard management policies and programs, with a focus of planning and community training/drills.

PROGRAMS

- National Flood Insurance Program

The Shoalwater Bay Tribe is in the NFIP and in good standing. Flood hazard maps were updated in 2015 and included for this plan update. The tribe does not have any repetitive or severe repetitive loss structures.

Table 13: NFIP Status

CID	Comm Name	County	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Init FHBM Identified	Tribal
530341A	**Shoalwater Bay Tribe**	**Pacific Co.**		**5/18/2015**	**1/4/2002**	**5/18/2015**	**Yes**

- TsunamiReady, StormReady
    - Recently updated for 3 years (2019)

PLANS

During the plan update process, the following plans were finalized, adopted and/or updated.

- FEMA Tribal Hazard Mitigation Plan (updated for 2019)
- Comprehensive Emergency Management Plan
- Continuity of Operations Plan
- Disaster Recovery Plan (new, 2019)
- Debris Management Plan
- Individual Households & Special Needs Assistance Plan (new 2019)

TRAINING AND EXERCISES

- Yellow Brick Road – yearly exercise for tsunami evacuation, awareness
- Community Emergency Response Team – continual training and exercise. Participation in community events. At least 200 members trained, including Tribal Council.
- Emergency management program conducts numerous emergency preparedness and response trainings for staff and community members.

COMMUNICATIONS

- AHAB warning sirens
  Two All Hazard Alert Broadcast (AHAB) warning sirens are located on tribal lands, GEORGE serving the area around the tribal center and Casino, and DAVE providing coverage around Toke Point.. The vertical evacuation tower be near the siren on Toke Pt. The sirens are funded to be upgraded in 2020. The tribe's two tsunami warning sirens are named after retired WA EMD emergency managers Dave Nelson and George Crawford.
- Tribal RACES/Ham radio group: numerous tribal members licensed and trained to use ham races.

- Coast guard radio tower to be built at Emergency Building on Eagle Hill.
- NOAA radios in all tribal buildings

EVACUATION

- Evacuation routes and signage
- Evacuation staging areas – safe zones
- Tsunami vertical evacuation tower (to be completed fall 2020)

EVALUATION OF EXISTING TRIBAL LAWS, POLICIES, AND PROGRAMS

The tribe has limited laws, regulations, policies, programs and resources related to hazard mitigation and development in hazard-prone areas, but nonetheless has been successful in using its capabilities.

The Tribe has chosen to limit the amount of formal laws and regulations it adopts due to limited jurisdiction (Reservation and trust lands only), as well as limited resources to implement and enforce.

TRIBAL NATION STATUS

The Shoalwater Tribe has unique capability to work directly with federal partners for funding and assistance related to hazard mitigation, as well as disaster response and recovery. Tribal leadership also has capability to work and meet directly with Executive and Congressional leadership and address congress and its committees.

OPPORTUNITIES

The tribe's main opportunities lie in its status as sovereign tribal nation within the United States, and its ability and agility to more directly manage its efforts in mitigation and resiliency.

- Nation to status –direct grant and funding partnership with state and federal agencies
- Economic development – The tribe has the ability for economic development that may not be available to local jurisdictions as it can set its own regulations and policies for activities that may not permitted or highly regulated off Reservation and trust lands

CHALLENGES

- Limited resources – financial and staffing
- Limited land use authority – only subject to trust and reservation lands
-

TRIBAL FUNDING SOURCES FOR HAZARD MITIGATION

EXISTING FUNDING SOURCES

2019 PLAN UPDATE

This section was revised to reflect updated FEMA plan requirements. A list of existing funding related to hazard mitigation was compiled.

NON-FEMA SOURCES

The Shoalwater Tribe generally utilizes tribal funding and funding from various federal agencies to support its hazard mitigation efforts. In addition, the Tribe utilizes technical support from various federal and state agencies that assists in its hazard mitigation efforts. This includes wider regional projects that overlap or affect the tribe's Reservation and properties, and thus contribute to the tribe's mitigation efforts. Recent examples include:

- **Eagle Hill Road Slope Stabilization, Road-Widening and Multipurpose Building Construction Project, 2012**
  U.S. Housing and Urban Development (HUD) awarded $481,000 for construction of the multipurpose building. More detail of the project is discussed in FEMA-funded mitigation efforts.

- **SR 105 - North Cove Vicinity - Erosion Protection 2017 – WA Dept. of Transportation**[25]
  This $3.6 million project updated previous repair work done in the area in 2015. High tides and several harsh winter storm events brought debris and water onto the roadway, causing damage and eroding sections of the shoreline and rock wall. This project, which occurred on the embankment alongside State Route 105, between mileposts 19.57 and 20.58, just north of the Reservation, replaced damaged sections of roadway by adding a revetment and debris berm. This project benefits the tribe by stabilizing SR 105 and minimizing road closures in a section subject to severe coastal erosion and damage. This is the only road that allows access to points north from the Reservation, including Westport.

- **Shoalwater Bay Berm Monitoring Report, WA Dept. of Ecology, August 2017**[26]
  From the introduction:
  - Over a period of two years, from September 2014 to September 2016, the WA State Dept. of Ecology Coastal Monitoring & Analysis Program (CMAP) performed a series of five surveys to collect continuous, high-resolution nearshore bathymetry and beach topography data of the Shoalwater Bay/North Cove area. The purpose of these surveys was to monitor a 2.5 km long berm constructed in 2012 by the U.S. Army Corps of Engineers (USACE) along Empire Spit and quantify morphological changes along the shoreline extending from the SR 105 groin to Toke Point as part of the Shoalwater Bay Shoreline Erosion Project.

[25] https://www.wsdot.wa.gov/Projects/SR105/ncovevicerosionprotection/default.htm

[26] https://fortress.wa.gov/ecy/publications/documents/1706024.pdf

As outlined by the USACE in the Cooperative Agreement, this monitoring program is needed to:

1. Provide the data necessary to quantify the level of protection provided by the Shoalwater dune restoration project. The restored dune provides coastal storm damage reduction for the Shoalwater Indian Reservation and requires periodic re-nourishment to maintain the designed level of protection. These monitoring data will be critical in determining the rate of erosion and quantities required for the next planned nourishment.
2. Monitor the morphology of Graveyard Spit over time to comply with prior agreements with U.S. Fish and Wildlife Service regarding habitat provided to listed Endangered Species Act species Western Snowy Plover.
3. Provide data necessary to refine the sediment budget for the Willapa Bay inlet which includes the rapidly eroding shoreline adjacent to SR 105.

- **Tsunami Vertical Evacuation Tower, 2018**
  The Tribe was awarded a FEMA PDM project grant in 2018 to construct a 50' high tsunami vertical evacuation tower. The tribe is expected to contribute at least $1 million to the project. In addition, in-kind planning, grant, and design assistance was provided by numerous agencies, including WA EMD, and WSDOT's Visual Engineering Resource Group.

Figure 43: Rendering of future Tsunami Evacuation tower, near Toke Pt.

 [27]

[27] Visualizations of tower courtesy of WSDOT Visual Engineering Resource Group

Figure 44: Aerial rendering of future Tsunami Evac Tower

US ARMY CORPS OF ENGINEERS PROJECTS

The USACE has provided funding to protect the Shoalwater Bay Tribe from coastal erosion, storm surge and storm debris. Below is a list of existing efforts.

2001 – **1,700 foot flood berm**

> Winter storms in 1998-1999 caused two breaches to form in the barrier dune, resulting in storm wave run-up and flooding of shoreline areas where tribal development is concentrated. To provide partial protection to the Tribal Center, a 1,700-foot-long shoreline flood berm was constructed in 2001 by the Corps.

December 2007 – **a 300 foot extension of the flood berm was a constructed by the Corps.**

2009- **Corps releases report on Shoalwater Bay Shoreline Erosion**[28]

> Six of the twelve extreme water levels recorded since 1973 have occurred since 1999. Coastal storms that coincided with these extreme water levels in March 1999, December 2001, February 2006, and December 2007 resulted in significant erosion and storm wave overtopping of the barrier dune, some erosion of the shoreline, and flooding of tribal uplands.

28 https://www.nws.usace.army.mil/Portals/27/docs/civilworks/projects/Shoalwater%20Decision%20Doc%20JULY%202009%20FINAL%20w%20errata.pdf

These events created a growing sense of urgency on the part of the Shoalwater Tribe for implementation of long-term coastal erosion protection and storm damage reduction measures.

Barrier dune restoration (Alternative 6 in the report) was considered the most appropriate long term solution to the coastal erosion and resulting storm damage problems affecting the Shoalwater Reservation. It was estimated to cost $25 million, and consisted of building a 12,500 berm like dune along the outer edge of Graveyard Spit..

October 2013 – **initial project to restore barrier dunes on Graveyard Spit completed.**

2018- **Barrier dune repair project**[29]

After initial construction in 2013, the Corps estimated that it would maintain the barrier roughly every five years by dredging material to place on existing dune.

However, the winter of 2015/2016 the dune was severely damaged by the strongest El Niño year in the El Niño-Southern Oscillation (ENSO) cycle since 1997/1998. These storms generally caused greater coastal erosion than observed during the 1997/1998 El Niño. Events in March 2016 and October 2016 significantly eroded the northern 3,200 feet of dune resulting in over-wash and deposition of sand in the North Cove embayment.

Without the proposed project repair, the limited wave protection currently afforded by the eroded barrier dune would continue to decrease, and flooding of the Shoalwater Reservation and adjoining lands would occur at increasingly frequent intervals.

The proposed project repair consists of emergency restoration of the deteriorated barrier dune system to protect the Shoalwater Reservation. The $19.9 M project was completed in the summer of 2018.

FEMA-FUNDED HAZARD MITIGATION EFFORTS

The Shoalwater Bay has utilized and applied for numerous FEMA grants to supports its mitigation efforts. It has received three PDM planning grants to support development of its initial hazard mitigation plan in 2008, as well as for 2014 and 2019 Plan Updates.

With a FEMA-approved tribal hazard mitigation plan, the Tribe has also applied for PDM project grants.

The following table shows status of Shoalwater Bay Tribal applications through PDM grant program:

[29] https://usace.contentdm.oclc.org/digital/collection/p16021coll7/id/11060/

Table 14: Shoalwater Bay PDM grant applications

Shoalwater Bay Tribe PDM grant applications

Fiscal Year	Project	Federal cost- share	Status
FY18	Water Tower Retrofit	$37,464	Did Not Meet HMA Requirements
FY18	Generator Backup Systems Final	$361,386	Did Not Meet HMA Requirements
FY17	Vertical Evacuation Tower	$2,281,860	Awarded
FY17	Defensible Spaces Project	$69,200	Identified for Further Review
FY17	Generator Backup Systems	$143,430	Identified for Further Review

EAGLE HILL ROAD SLOPE STABILIZATION, ROAD-WIDENING AND MULTIPURPOSE BUILDING CONSTRUCTION PROJECT – 2012

The tribe received a $1.4 million HSGP grant to widen and stabilize the Tribe's tsunami evacuation route, Eagle Hill Road, and construct a multipurpose building and evacuation staging area at an elevation of 55', out of the tsunami inundation zone. HUD contributed $481,000 towards construction of the multipurpose building. The rest of the funding came from the FY2011 Homeland Security Grant Program.

TSUNAMI VERTICAL EVACUATION TOWER - 2018

The Shoalwater Bay Tribe was awarded a PDM grant in 2018 for $2.2 million, a 90% federal match for the estimated $2.5 million project to build a tsunami vertical evacuation tower adjacent to tribal housing on Toke Point. The safe refuge platforms will be built above the predicted tsunami wave crest height. With a total useable area of 3,400 square feet, it will accommodate the 386 people. The proposed site will provide a safe evacuation place for not just Shoalwater Bay Indian Tribal members, but also residents in the surrounding community. The project is designed in conformance with the 2012 FEMA P-646 Guidelines for Design of Structures for Vertical Evacuation from Tsunamis. This also fulfills Mitigation Action S-14 from the 2014 Plan update, which addresses tsunami vertical evacuation. The tower is planned to be completed by fall 2020.

OTHER FEMA FUNDING

The Hazard Mitigation Grant program (HMGP) assists in implementing long-term hazard mitigation planning and projects following a Presidential Major Disaster Declaration. The Tribe has not applied for HMGP grants related to disaster declarations in the Pacific County area. Since the previous plan update in 2014, the only disaster declaration for the Shoalwater Bay Tribe/Pacific County has been DR-4253, for

severe weather, flooding and landslides in December 2015[30]. There is no record of the Tribe utilizing other FEMA funding, such as FMA, PA (C-G), and FMAG.

POTENTIAL FUNDING SOURCES

2019 PLAN UPDATE

A list of potential funding sources has not change since the initial plan development and 2014 update. The Disaster Recovery Reform Act of 2018 (DRRA) passed by Congress at the end of 2018, will potentially provide new and/or expanded funding sources for tribal mitigation efforts. Details and processes have not been finalized during drafting of this plan, but generally include:

- Increases funding for hazard mitigation in a new national Pre-Disaster Mitigation account.
- Creates new funding for local, tribal and state wildfire prevention and mitigation practices.
- Authorizes FEMA to provide grants to state and tribal governments to directly administer housing construction, including reimbursement.
- Expands grants for Other Needs Assistance and Housing Assistance.

FEDERAL

Below are listed the primary federal programs and agencies that can potentially fund mitigation actions and planning.

Pre-Disaster Mitigation Program, which provides funds to develop mitigation plans and implement mitigation projects, is administered by FEMA;

Hazard Mitigation Grant Program, which provides post-disaster funds for hazard reduction projects (e.g., elevation, relocation, or buyout of structures), is administered by FEMA and the Washington State Emergency Management Division;

Flood Control Assistance Account Program, which provides funds for developing flood hazard management plans, for flood damage reduction projects and studies, and for emergency flood projects (e.g., repair of levees), is administered by the Washington State Department of Ecology (Ecology);

Flood Mitigation Assistance Program, which provides funds for flood mitigation on buildings that carry flood insurance and have been damaged by floods, is administered by FEMA;

Department of Homeland Security funding, in addition to FEMA programs;

U.S. Fire Administration, which provides wildfire program funds;

[30] https://www.fema.gov/disaster/4253

Environmental Protection Agency, which could provide funds for projects with dual hazard mitigation and environmental protection goals as well as updates to this HMP and related planning efforts such as spill prevention and response planning;

Indian Health Service, which could provide funds for hazard mitigation projects that address public health and safety;

Rural Development Agency, USDA, which provides loan and grant funds for housing assistance, business assistance, community development, and emergency community water and wastewater assistance in areas covered by a federal disaster declaration;

Community Development Block Grant, which provides funds for a variety of community development projects, is administered by the Department of Housing and Urban Development;

Small Business Administration Loans, which help businesses recover from disaster damages, is administered by the Small Business Administration; and

Bureau of Indian Affairs, which provides funds to support tribal activities.

U.S. Army Corps of Engineers, which provides funding for coastal and waterway projects

TRIBAL

The Shoalwater Bay Tribe is fully committed to the public safety and welfare of its residents and tribal members and to the goals of the Shoalwater Bay Tribal Hazard Mitigation Plan. The Tribe has only limited resources though to devote to mitigation planning. Nonetheless the Tribe may be willing to match grant funding, either through direct monies or through the allocation of resources, such as labor and expertise, in order to implement the actions discussed in this plan.

STATE/LOCAL

In some cases, funding may be available from the State of Washington and/or Pacific County, especially on mitigation actions that overlap jurisdictions, such as road and flood mitigation projects. The main resource for funding opportunities from the State of Washington is from the Washington State Emergency Management Division, which helps fund mitigation projects. The Shoalwater Bay Tribe is continually building relationships with the State of Washington, Pacific County, Grays Harbor County as well as local communities such as Tokeland, in order to develop partnerships to implement mitigation measures that are regional in scope.

PRIVATE

No potential funding from the private sector is currently identified. Nonetheless local businesses and residents will be encouraged to participate and contribute to the mitigation effort.

MITIGATION GOALS

The following goals have been established by the Shoalwater Bay Tribe to guide its efforts and measure successful implementation of its hazard mitigation program. These goals support and further the Tribe's Mission Statement:

> *"To become self-sufficient and provide for the spiritual, social, economic and health of tribal members, while honoring traditions of the past and leaving a responsible legacy for future generations."*

Goal 1. Protect people, property and the natural environment

Goal 2. Ensure continuity of critical economic and public facilities and infrastructure

Goal 3. Promote and protect Tribal sovereignty and identity

Goal 4. Increase public awareness of natural hazards and involvement in hazards planning

2019 PLAN UPDATE

These goals were established during the development of the Tribe's initial plan in 2008. For the 2014 plan update, these goals were affirmed. For the 2019 plan update, the goals were reviewed in conjunction with other tribal goals and priorities, implementation of mitigation actions, changes in development, as well as better understanding of hazards and tribal vulnerability. As a result, the tribe continues to affirm these goals.

PLAN STRATEGIES

The Shoalwater Bay developed 6 hazard mitigation strategies that support its overall Tribal Mission Statement as well as the four goals of its hazard mitigation program. In turn these strategies will be achieved by successfully implementing the mitigation strategies the tribe has identified during the plan update process.

Table 15: 2019 Plan Strategies

2019 Shoalwater Bay Tribe Mitigation Strategies
1) Pursue relocation and future development outside hazard zones
2) Harden existing facilities, infrastructure, and homes as needed
3) Continue development and expansion of evacuation routes and emergency facilities
4) Reduce increased threat from wildfires
5) Reduce continued threat from coastal erosion
6) Continue to expand and improve emergency management preparedness and response capabilities

2019 UPDATE

The Tribe for its plan update conducted a comprehensive review of its mitigation goals, objectives and actions identified in the original plan and in the 2014 plan update. The Tribe's mitigation priorities, as well as its successes and challenges implementing its mitigation program, were analyzed within the lens of the Tribe's overall community priorities and capabilities, as well as increased understanding of the impacts from natural hazards.

With this understanding, the Tribe, for this update, sought to refocus and streamline its mitigation objectives and actions. The 2014 plan update listed 15 objectives. For this plan, these were reprioritized as 6 Strategies. The mitigation actions subsequently identified in this plan are grouped under individual strategies to better clarify how said actions support the overall strategies. In the long- term, it is hoped that this format will help achieve success in identifying, prioritizing and implementing mitigation actions.

The 2014 Plan objectives can be found in **Appendix C: 2014 Hazard Mitigation Plan Objectives**

IDENTIFY AND ANALYZE POTENTIAL MITIGATION ACTIONS

The following pages list the Shoalwater Bay Tribe's 2019 mitigation actions that when successfully implemented, will support the hazard mitigation strategies that will reduce the tribe's impact and vulnerability to the natural hazards identified in the risk assessment and meet the Tribe's overall mitigation goals and Mission Statement.

A wide range of projects were identified using feedback and suggestions from tribal leadership and staff, local, state and federal partners, as well as local community members. Projects were analyzed for relevancy to hazards threat and ability to reduce risk to existing and future buildings and infrastructure, as well as Tribe's capacity to implement.

2019 PLAN UPDATE

Mitigation actions from the 2014 plan, as well as the 2008 original plan were reviewed. Best practices and alternative mitigation actions were identified from academic, state and federal sources. Generally the tribe sought to update and continue the mitigation actions identified in the 2014 plan, as well as add mitigation actions to reflect current priorities and address emerging threats/impacts. For this plan update, 25 mitigation actions are grouped under the six overall strategies that they support.

Please note that these actions are not prioritized within each strategy, and focus on implementation by lead department, potential funding sources and work plan timeline.

Strategy 1

Pursue relocation and future development outside hazard zones

action		*reference to 2014 plan*	*lead, other*	*funding source(s)*	*timeline*
1.1	Develop plan that identifies alternative sources and needed infrastructure for **potable water systems** that adequately meet Tribe's future needs and address impacts from drought and sea-level rise.	S-5	Planning	Tribal funds	3-5 years
1.2	Identify and implement **stormwater management actions** for current and future development that mitigate localized flooding and storm surge.	S-10	Natural Resources, Planning	Tribal funds	3-5 years
1.3	Seek grant funding to construct a **public safety facility** to include a police and fire station, court house, meeting facility and EOC on the Reservation, and acquire personnel and equipment that can also accommodate the expansion to include wildland fire services on the Reservation.	S-53	Emergency Mgmt., Tribal Council	Grant funds, tribal funds	3-5 years
1.4	Focus all **new development**, including critical facilities, infrastructure and housing, outside of tsunami inundation & high velocity areas as well as other high hazard areas.	new	Tribal Council	Tribal funds, BIA, HUD	long-term

Strategy 2 **Harden existing facilities, infrastructure and homes as needed**					
action		*reference to 2014 plan*	*lead, other*	*funding source(s)*	*timeline*
2.1	Identify and implement **hillside stabilization projects** where needed to reduce current and future impacts from landslides and erosion, utilizing low impact natural systems.	S-8	Natural Resources	tribal funds	on-going
2.2	Secure funding to **acquire additional generators** to maintain critical infrastructure on reservation, including for water systems, especially for new facilities being constructed or older facilities being renovated that do not already have generators.	S-9	Emergency Mgmt.	FEMA grant funds, tribal funds	on-going
2.3	**Work with local partners,** including WSDOT and Pacific County, to reduce vulnerability and impacts from landslides and washouts along SR 105 outside of the Tribe's jurisdiction.	S-19	Emergency Mgmt.	WSDOT, WA EMD	on-going
2.4	**Seismically retrofit** water towers and water storage structures utilizing grant support.	S-32	Emergency Mgmt.	FEMA grant funds, tribal funds	3-5 years
2.5	Enhance and expand **existing water systems** on Reservation to increase capacity of water storage facilities; obtain alternate sources (wells) and increase capacity to enable ability to utilize fire hydrants without damaging existing infrastructure and reducing capacity for residents.	S-34	Bldg. Maintenance, Tribal Council	tribal funds, BIA	3-5 years
2.6	Identify potential mitigation actions to reduce impact of natural hazards to inventoried **cultural resources and sites**, such as historic camps and villages.	S-47	Education & Heritage/Cultural	tribal funds	1-3 years
2.7	Work with local utility service providers to harden and/or install **underground utility lines** (power, phone, internet) and add **additional repeaters and network capacity**, which will provide higher quality and less disrupted services.	S-56	Tribal Administrator, Tribal Council	private funds, tribal funds	on-going

Strategy 3

Continued development and expansion of evacuation routes and emergency facilities

action		*reference to 2014 plan*	*lead, other*	*funding source(s)*	*timeline*
3.1	Work with local and federal partners to improve existing **tsunami vertical evacuation structure**; assess need for additional structures.	S-14	Emergency Mgmt.	FEMA grants, tribal funds	3-5 years
3.2	Continue to improve **evacuation routes and signage** as needed. Work with local partners outside of tribal jurisdiction to enhance evacuation routes and signage.	S-24	Emergency Mgmt.	tribal funds, local funds	on-going
3.3	Enhance **existing shelters** as needed to have back-up generators, communications systems as well as kitchen, shower/bathroom, and heating systems.	S-50	Emergency Mgmt.	FEMA grants, tribal funds	on-going
3.4	Build a tornado and severe **weather evacuation shelter and/or saferooms**. These shelter locations shall include, at a minimum, back-up power generators, communications, water and heating systems, and kitchen, shower/bathroom facilities. The shelters should meet the access and functional needs of all individuals.	new	Emergency Mgmt.	FEMA grants, BIA funds, tribal funds	3-5 years

Strategy 4 **Reduce increased threat from wildfires**					
action		*reference to 2014 plan*	*lead, other*	*funding source(s)*	*timeline*
4.1	Develop a **forest fuels management program** that includes a fuels reduction strategy and promotes forest health, such as the planting of native fire-resistant plants.	S11, S-13	Natural Resources	tribal funds, grants	1-3 years
4.2	Working with South Beach Regional Fire Authority, **secure grant** to purchase a **mobile "Fire Prevention Safety Trailer**."	S-55	Emergency Mgmt.	FEMA grants, tribal funds	1-3 years

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Strategy 5 **Reduce continued threat from coastal erosion**					
action		*reference to 2014 plan*	*lead, other*	*funding source(s)*	*timeline*
5.1	Continue to actively **monitor coastal erosion** at North Cove/Graveyard Spit shoreline and work with local, state and federal partners to develop long-term mitigation solutions.	S-51, new	Natural Resources, Emergency Mgmt.	US Army Corps of Engineers, WA Dept. of Ecology, tribal funds	on-going
5.2	Work with federal legislators to fund continued Army Corps of Engineers' monitoring and on-going maintenance, enhancement and expansion of **barrier dune and related erosion control projects** at North Cove/Graveyard Spit beach.	S-51, new	Tribal Council	tribal funds	on-going

Strategy 6

Continue to expand emergency management preparedness and response capabilities

action		*reference to 2014 plan*	*lead, other*	*funding source(s)*	*timeline*
6.1	Develop (and update as required) a **post-disaster action plan** for all hazards of concern that addresses debris management, cultural/historical data gathering, substantial damage assessment, and grant management. This plan would be an appendix to the Tribe's Comprehensive Emergency Management Plan.	S-1	Emergency Mgmt.	tribal	1-3 years
6.2	Evaluate and adopt **tribal policies and codes** that increase resiliency to natural hazards, such as stronger building codes, stormwater and potable water management plans, wildfire management programs, and land use & development policies.	S-6	Tribal Council	tribal	on-going
6.3	Maintain and expand a **public outreach strategy** of on-going programs providing multiple messages that support all phases of emergency management, including the maintenance of a 7-day supply of food and water. This should include CERT training. Training program should also include an outreach program for elders and sensitive populations to provide assistance as needed.	S-20	Emergency Mgmt., Wellness Center	tribal	on-going
6.4	Continue to update as required and needed, **emergency plans** including: FEMA Hazard Mitigation Plan, Comprehensive Emergency Management Plan, Continuity of Operations Plan, Disaster Recovery Plan, Debris Management Plan, Individual Households & Special Needs Assistance Plan.	S-27	Emergency Mgmt.	tribal, grants funds	on-going
6.5	Continue **participation and renewal** in National Weather Service's StormReady and TsunamiReady community program.	S-31	Emergency Mgmt.	tribal	on-going
6.6	Work with local, federal and private partners to install and maintain **additional early warning and updated communication systems** community-wide to provide enhanced coverage and redundancy. This includes additional towers, repeaters and support equipment.	S-49	Emergency Mgmt.	grant funds, tribal	on-going

PRIORITIZE, IMPLEMENT AND ADMINISTRATE MITIGATION ACTIONS

PRIORITIZE ACTIONS

Mitigation actions for this plan were prioritized via discussion amongst Tribal Council and the Tribe's Emergency Management Office and emergency planning committee, as well as feedback from the tribal community and outside partners and stakeholders. Mitigation actions were prioritized and included in the plan based on the following criteria:

- The action supported the Tribe's overall priorities as reflected in the updated Strategies. Previous Actions that were no longer a tribal priority were omitted. Mitigation actions that supported new priorities were added.
- On-going actions – previous mitigation actions that by definition are on-going or were in process of being implemented on a long-term basis were included if they also supported current tribal priorities and strategies.
- Feasibility – actions that were not feasible due to financial or capability limitations were not included.
- Redundancy – some mitigation actions were redundant or conflicted in terms of implementation. These actions were reprioritized and modified as needed to better align with the Tribe's overall strategy.

RESPONSIBILITY FOR IMPLEMENTATION AND ADMINISTRATION

The overall responsibility of implementing and administering the hazard mitigation strategies and actions shall be the Tribal Council and its Tribal Administrator/CEO. Day-to-day and program implementation and administration of the actions shall be managed by the Emergency Management Director, with support from the emergency planning committee, and tribal departments and staff as required.

INCORPORATE HAZARD MITIGATION PLAN INTO OTHER TRIBAL PLANNING MECHANISMS

The Shoalwater Bay Tribe is acutely aware of the hazards it faces, whether annual winter storms, long-term effects from coastal erosion and climate change, or the once-in-a-multi-generational earthquake/tsunami.

Through both formal and informal planning processes, the Tribe incorporates the overall goals, the findings of the risk assessment, and objectives/actions of the hazard mitigation plan into its public safety, community development, natural resources and economic development efforts.

As the tribe generally has not developed formal planning documents or processes, such as a zoning code or comprehensive land use plan, the process the tribe will utilize to incorporate the mitigation plan into other tribal planning mechanisms will consist of:

- Coordination with tribal staff and leadership through the Emergency Planning Committee.

This committee is made up of staff and directors from different tribal departments and council, and is the primary method for the Tribe to coordinate its efforts and ensure that individual departmental planning processes and projects incorporate and utilize the hazard mitigation plan.

- The Emergency Management Director will coordinate with tribal staff and departments as needed during any tribal planning processes to ensure that the mitigation plan, its findings and actions, are incorporated.
- The Emergency Management Director will lead on coordinating with the Tribal Administrator and Tribal Council to ensure that any on-going and future tribal planning processes and projects incorporate the hazard mitigation plan.

Currently the Tribe integrates the plan into its emergency management and preparedness program, used as a basis for all of the Tribe's emergency plans, as well as for training, drills and exercises.

2019 PLAN UPDATE

For this update, other tribal planning efforts were reviewed to ensure that they were informed by the hazard mitigation planning process. The Tribe affirms that it will continue to incorporate the hazard mitigation plan into all current and future planning efforts, both formally and informally.

The 2014 plan identified planning documents the Tribe was developing that would be linked to the hazard mitigation plan, specifically a Comprehensive Plan. The plan update process indicated that the Tribe did not make progress developing a Comprehensive Plan or implementing other planning processes that could incorporate the hazard mitigation plan, so this section was revised to reflect the process the tribe will follow during the next five years.

REVIEWING PROGRESS AND MONITORING IMPLEMENTATION

The process of reviewing progress and monitoring implementation of mitigation projects, including those not listed in this plan, or funded specifically by FEMA, will be led by the Director of the Shoalwater Bay Emergency Management Dept. The Tribal Council, Tribal Administrator, and/or the Director may direct or appoint tribal staff and committees, as needed, to assist in review and monitoring.

As part of its emergency management program, the Director will frequently review and track progress on the implementation of mitigation actions. The Director will also meet with staff from Tribal Departments, where applicable, to discuss progress of mitigation activities. The Director will report progress to the Tribal Council as requested, or at least annually.

The implementation of all short-term mitigation actions will be monitored by the Director on an ongoing basis until implementation is complete. Long-term actions being actively implemented will be monitored on an ongoing basis, or at least annually as needed. Long-term actions planned for the future will be reviewed during plan updates every five years.

For FEMA-funded projects, the Director of Emergency Management will lead in ensuring that tribal staff tracks, prepares, and submits all required progress reports and other grant compliance as needed. The Director will work with Tribal staff to ensure a timely and successful grant close-out process.

2019 PLAN UPDATE

This section was revised to meet FEMA requirements for tribal hazard mitigation plans.

ASSURANCES & PLAN ADOPTION

ASSURANCES TO COMPLY WITH FEDERAL STATUTES AND REGULATIONS

The Shoalwater Bay Indian Tribe assures that it will comply with all applicable federal statutes and regulations in effect with respect to the periods for which it receives grant funding including 2 CFR Parts 200 and 3002. The Tribe will amend its mitigation plan whenever necessary to reflect changes in tribal or federal laws and statutes.

TRIBAL ADOPTION

The 2019 Shoalwater Bay Tribal Hazard Mitigation Plan Update was formally adopted by the Shoalwater Bay Tribal Council on March 18, 2020 as Resolution #3-18-20-14.

APPENDIX A: TRIBAL ADOPTION RESOLUTION

SHOALWATER BAY INDIAN TRIBE
P.O. Box 130 • Tokeland, Washington 98590
Telephone (360) 267-6766 • FAX (360) 267-6778

SHOALWATER BAY INDIAN TRIBE

Resolution: # 3-18-20-14

WHEREAS, the Shoalwater Bay Tribe is a Federally recognized Tribe headquartered on the Shoalwater Bay Indian Reservation in the State of Washington, and

WHEREAS, the Shoalwater Bay Tribal Council is the governing body of the Shoalwater Bay Tribe in accordance with their Constitution and By-laws, and

WHEREAS, the Shoalwater Bay Tribal Council is charged with the responsibility and is committed to saving lives and to preserving the safety, health, and welfare of all people who live on, work on, and visit our reservation, and to the preservation of our lands, environment, and our culture; and

WHEREAS, the Shoalwater Bay Tribal Council] recognizes the threat that natural hazards pose to people and property within the Shoalwater Bay Tribe, and

WHEREAS, the Shoalwater Bay Tribe has prepared a multi-hazard mitigation plan update, with the assistance of a contractor, in accordance with the Disaster Mitigation Act of 2000 and the requirements in Title 44 Code of Federal Regulations Section 201.7;

WHEREAS, adoption of this plan will make the Shoalwater Bay Tribe eligible for funding to alleviate the impacts of future hazards on the Reservation,

NOW THEREFORE BE IT RESOLVED, that the Shoalwater Bay Tribal Council adopts the Shoalwater Bay Tribal Hazard Mitigation Plan as its updated strategy to mitigate the effects of natural hazards.

CERTIFICATION

The above resolution was passed as an emergency Council response activated on March 18, 2020 at the Shoalwater Bay Indian Tribe, at which a quorum was established.

5 FOR 0 AGAINST 0 ABSTAIN

Charlene Nelson, Chairwoman

Lynn Clark, Secretary

APPENDIX B: FEMA APPROVAL LETTER

U.S. Department of Homeland Security
Region X
130 228th Street, SW
Bothell, WA 98021-8627

FEMA

March 20, 2020

The Honorable Charlene Nelson
Chairwoman, Shoalwater Bay Indian Tribe
P.O. Box 130
Tokeland, Washington 98590

Dear Chairwoman Nelson:

Congratulations, on March 20, 2020, the United States Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10 approved the Shoalwater Bay Tribal Hazard Mitigation Plan as a Tribal Mitigation Plan, in accordance with Code of Federal Regulations Title 44 Part 201.

An approval provides the Shoalwater Bay Indian Tribe eligibility to apply directly with FEMA for Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) programs, i.e., Pre-Disaster Mitigation project grants, Public Assistance (Categories C-G), Fire Management Assistance and Hazard Mitigation Grant Program (HMGP) projects through March 19, 2025. Recipients must develop and maintain hazard mitigation plans compliant with FEMA standards as a condition for receiving funds. To continue eligibility, within five years from date of this letter, tribes must review, revise as appropriate and re-submit plans for approval. For further assistance on hazard mitigation planning, please contact our Regional Mitigation Planning Program Manager, John Schelling, at (425) 487-2104.

FEMA evaluates applications for funding according to the specific requirements of the applicable program. A mitigation action identified in the plan may, or may not, meet a program's eligibility requirements. For assistance with hazard mitigation grant funding, please contact FEMA-R10-HMA@fema.dhs.gov.

We look forward to continuing a productive relationship between FEMA Region 10 and the Shoalwater Bay Indian Tribe. Our Regional Tribal Liaison Erin Ward, at (425) 487-4567, is available to facilitate this relationship and delivery of our programs. You are also welcome to contact me directly, at (425) 487-4604.

Sincerely,

VINCENT J MAYKOVICH
Digitally signed by VINCENT J MAYKOVICH
Date: 2020.03.24 17:10:25 -07'00'

Michael F. O'Hare
Regional Administrator

Enclosures

cc: Tim Cook, Washington Emergency Management Division

www.fema.gov

APPENDIX C: 2014 HAZARD MITIGATION PLAN OBJECTIVES

2014 SHOALWATER BAY TRIBE HAZARD MITIGATION PLAN OBJECTIVES

Objective #	Objective Statement	Goals for which it can be applied
O-1	Acquire (purchase), retrofit, or relocate structures in high hazard areas.	1
O-2	Encourage open space uses in hazardous areas or ensure that if building occurs in these high-risk areas that it is done in such a way as to minimize risk.	1, 2
O-3	Use best available data, science and technologies to improve understanding of location and potential impacts of hazards, and to promote disaster resilient communities by discouraging new development in hazardous areas or ensuring that development is done in such a way as to minimize risk.	3
O-4	Consider the impacts of natural hazards in all planning mechanisms that address current and future land uses on the Reservation.	4
O-5	Educate the reservation residents and surrounding communities on the risk exposure to natural hazards and ways to increase the member's capability to prepare, respond, recover and mitigate the impacts of these events.	3, 4
O-6	Increase resilience and the continuity of operations of identified critical facilities within the Reservation.	3
O-7	Preserve the Cultural Resources of the Shoalwater Bay Indian Tribe.	3
O-8	Provide/improve flood protection through various means, such as with flood control structures and drainage maintenance where appropriate and feasible.	4
O-9	Consider NFIP with the ultimate goal to lower the cost of flood insurance premiums through the CRS program.	4

O-10	Establish a partnership among the Tribal Government and Tribal business leaders with surrounding area government and business community to improve and implement methods to protect life, property and the environment, while preserving the cultural integrity of the Shoalwater Tribe and its members.	4
O-11	Enhance community emergency management capability (i.e., prepare, plan, respond, recover, mitigate).	3, 4
O-12	Encourage the development and implementation of long-term, cost-effective and environmentally sound mitigation projects.	1, 3, 4
O-13	Develop or improve emergency warning response and communication systems and evacuation procedures.	3, 4
O-14	Enhance land use regulations to proactively impact the hazards of concern.	1, 2, 3
O-15	Encourage hazard mitigation measures that result in the least adverse effect on the natural environment and that use natural processes, while preserving and maintaining the cultural elements of the Shoalwater Bay Indian Tribe.	All

APPENDIX D: SEA LEVEL RISE PROJECTIONS FOR SHOALWATER BAY RESERVATION/TOKELAND AREA

Source: Washington Coastal Hazards Resilience Network

http://www.wacoastalnetwork.com/wcrp-documents.html

data accessed August 30, 2019

Vertical land movement estimate and uncertainty (1 standard deviation) for this location: 0.4 ± 0.2 feet/century (negative values represent subsidence)

In the event of a subduction zone earthquake some parts of the Washington coast may be subject to land level change

Based on multiple seismic deformation models, in the event of a subduction zone earthquake this area may be subject to land level change of:

-3.4 to -5.6 ft

where negative values represent land level fall, or subsidence. Coastal subsidence during a subduction zone earthquake would have the effect of RAISING local relative sea level

Sea level rise planning efforts may benefit from taking this into account

RELATIVE SEA LEVEL PROJECTIONS FOR RCP 4.5 FOR THE COASTAL AREA NEAR: 46.7N, 124.0W

For more information about these projections go to www.coastalnetwork.com/wcrp-documents.html

Table 1: Projected average sea level magnitudes, in feet, for different assessed likelihoods and time periods

	Assessed Probability of Exceedance:									
19 year period centered on:	99	95	90	83	50	17	10	5	1	0.1
2010	-0.1	0	0	0	0	0.1	0.1	0.1	0.2	0.2
2020	-0.1	0	0	0	0.1	0.2	0.2	0.3	0.3	0.4
2030	-0.1	0	0	0.1	0.2	0.3	0.4	0.4	0.5	0.6
2040	-0.1	0	0.1	0.1	0.3	0.5	0.5	0.6	0.7	1
2050	-0.1	0.1	0.2	0.2	0.4	0.7	0.7	0.8	1.1	1.7
2060	-0.1	0.1	0.2	0.3	0.6	0.9	1	1.1	1.5	2.4
2070	-0.1	0.2	0.3	0.4	0.7	1.1	1.2	1.4	1.9	3.4
2080	-0.1	0.2	0.3	0.5	0.9	1.3	1.5	1.7	2.5	4.5

2090		-0.1	0.2	0.4	0.6	1	1.6	1.8	2.1	3.1	5.6				
2100		-0.1	0.2	0.4	0.6	1.2	1.9	2.1	2.5	3.8	7.1				
2110		-0.2	0.3	0.5	0.7	1.4	2.1	2.5	2.9	4.5	8.4				
2120		-0.2	0.3	0.5	0.8	1.5	2.4	2.8	3.3	5.2	10.1				
2130		-0.3	0.2	0.5	0.8	1.7	2.7	3.1	3.8	6.1	11.8				
2140		-0.4	0.2	0.5	0.8	1.8	3	3.5	4.3	7	13.7				
2150		-0.5	0.2	0.5	0.8	1.9	3.3	3.9	4.8	8	15.9				

Table 2: Assessed likelihood (in percentages) of sea level reaching or exceeding a threshold for different sea levels and dates

		Average Sea Level Magnitudes in Feet Relative to 1991-2009 Average													
19 year period centered on:		0	0.5	1	1.5	2	2.5	3	4	5	6	7	8	9	10
2010		79	0	0	0	0	0	0	0	0	0	0	0	0	0
2020		89	0	0	0	0	0	0	0	0	0	0	0	0	0
2030		95	1	0	0	0	0	0	0	0	0	0	0	0	0
2040		97	13	0	0	0	0	0	0	0	0	0	0	0	0
2050		98	39	2	0	0	0	0	0	0	0	0	0	0	0
2060		98	61	9	1	0	0	0	0	0	0	0	0	0	0
2070		98	75	24	4	1	0	0	0	0	0	0	0	0	0
2080		98	82	40	10	2	1	0	0	0	0	0	0	0	0
2090		98	85	53	20	6	2	1	0	0	0	0	0	0	0
2100		98	88	63	33	13	5	2	1	0	0	0	0	0	0
2110		98	90	69	43	21	9	4	1	1	0	0	0	0	0
2120		98	91	74	50	29	14	7	3	1	1	0	0	0	0
2130		98	91	77	57	36	21	12	4	2	1	1	0	0	0
2140		97	90	78	61	43	28	17	6	3	2	1	1	0	0
2150		97	90	79	65	48	33	22	9	4	2	1	1	1	0

RELATIVE SEA LEVEL PROJECTIONS FOR RCP 8.5 FOR THE COASTAL AREA NEAR: 46.7N, 124.0W

For more information about these projections go to www.coastalnetwork.com/wcrp-documents.html

Table 1: Projected average sea level magnitudes, in feet, for different assessed likelihoods and time periods

		Assessed Probability of Exceedance:													
19 year period centered on:		99	95	90	83	50	17	10	5	1	0.1				

2010		-0.1	-0.1	0	0	0	0.1	0.1	0.1	0.2	0.2			
2020		-0.1	0	0	0	0.1	0.2	0.2	0.2	0.3	0.4			
2030		-0.1	0	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.6			
2040		-0.1	0	0.1	0.2	0.3	0.5	0.5	0.6	0.8	1.1			
2050		0	0.1	0.2	0.3	0.5	0.7	0.8	0.9	1.1	1.8			
2060		0	0.2	0.3	0.4	0.7	1	1.1	1.2	1.6	2.7			
2070		0.1	0.3	0.4	0.5	0.9	1.3	1.4	1.6	2.2	3.7			
2080		0.1	0.4	0.6	0.7	1.1	1.6	1.8	2.1	2.8	5			
2090		0.1	0.5	0.7	0.8	1.4	2	2.2	2.5	3.6	6.4			
2100		0.2	0.6	0.8	1	1.7	2.4	2.7	3.1	4.5	7.9			
2110		0.3	0.7	0.9	1.1	1.8	2.6	2.9	3.4	5.1	9.3			
2120		0.4	0.8	1.1	1.3	2.1	3	3.4	4	6	11.1			
2130		0.4	0.9	1.2	1.4	2.3	3.4	3.9	4.6	7.1	13.4			
2140		0.4	1	1.3	1.6	2.6	3.9	4.5	5.3	8.2	15.4			
2150		0.4	1	1.4	1.7	2.9	4.4	5.1	6.1	9.4	18.2			

Table 2: Assessed likelihood (in percentages) of sea level reaching or exceeding a threshold for different sea levels and dates

		Average Sea Level Magnitudes in Feet Relative to 1991-2009 Average												
19 year period centered on:	0	0.5	1	1.5	2	2.5	3	4	5	6	7	8	9	10
2010	76	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	91	0	0	0	0	0	0	0	0	0	0	0	0	0
2030	96	1	0	0	0	0	0	0	0	0	0	0	0	0
2040	97	15	0	0	0	0	0	0	0	0	0	0	0	0
2050	98	48	3	0	0	0	0	0	0	0	0	0	0	0
2060	99	72	14	1	0	0	0	0	0	0	0	0	0	0
2070	99	86	38	7	2	0	0	0	0	0	0	0	0	0
2080	100	92	61	23	6	2	1	0	0	0	0	0	0	0
2090	100	95	75	41	16	5	2	1	0	0	0	0	0	0
2100	100	96	84	60	33	15	6	2	1	0	0	0	0	0
2110	100	98	87	64	38	18	9	3	1	1	0	0	0	0
2120	100	98	91	75	52	31	17	5	2	1	1	0	0	0
2130	100	99	93	81	63	43	27	9	4	2	1	1	0	0
2140	100	99	95	85	70	53	37	15	6	3	2	1	1	0
2150	100	99	95	88	76	62	47	23	10	5	3	2	1	1

APPENDIX E : COMMUNITY PROFILE

LOCATION AND GEOGRAPHY

The Shoalwater Bay Reservation is located on the north shore of Willapa Bay in Pacific County, Washington. At one-mile square, the original reservation is relatively small, with 2/3 lying at or below the intertidal zone. With additional trust lands and other land acquisitions over the last decade, the tribal land base is about 5.3 sq. miles. The Shoalwater Reservation is mostly in a flat area along the shore, with lands extending north toward a Pleistocene rock ridge, which generally runs east to west, and comes within 200 feet of the shore at Washaway Beach.

Washington SR 105 runs east west though the Shoalwater Reservation, with Toke Point Road running southeast off SR 105. Within the tidal portion of the Shoalwater Reservation (behind Graveyard Spit and including parts of North Cove) there are small bays, and extensive intertidal marsh communities. The marsh is a mix of native plants and invasive smooth cordgrass (*Spartina alterniflora*). None of the marsh adjacent to and within the reservation is listed by the Washington Department of Natural Resources as high quality natural heritage wetland.

VEGETATION

Marsh plants dominate the intertidal areas of North Cove. Species present include beach grass, sedges, rushes, Salicornia sp., and Spartina alternaflora. Upland areas are composed of coastal woodlands and residential ornamental plants and grasses.

SOILS

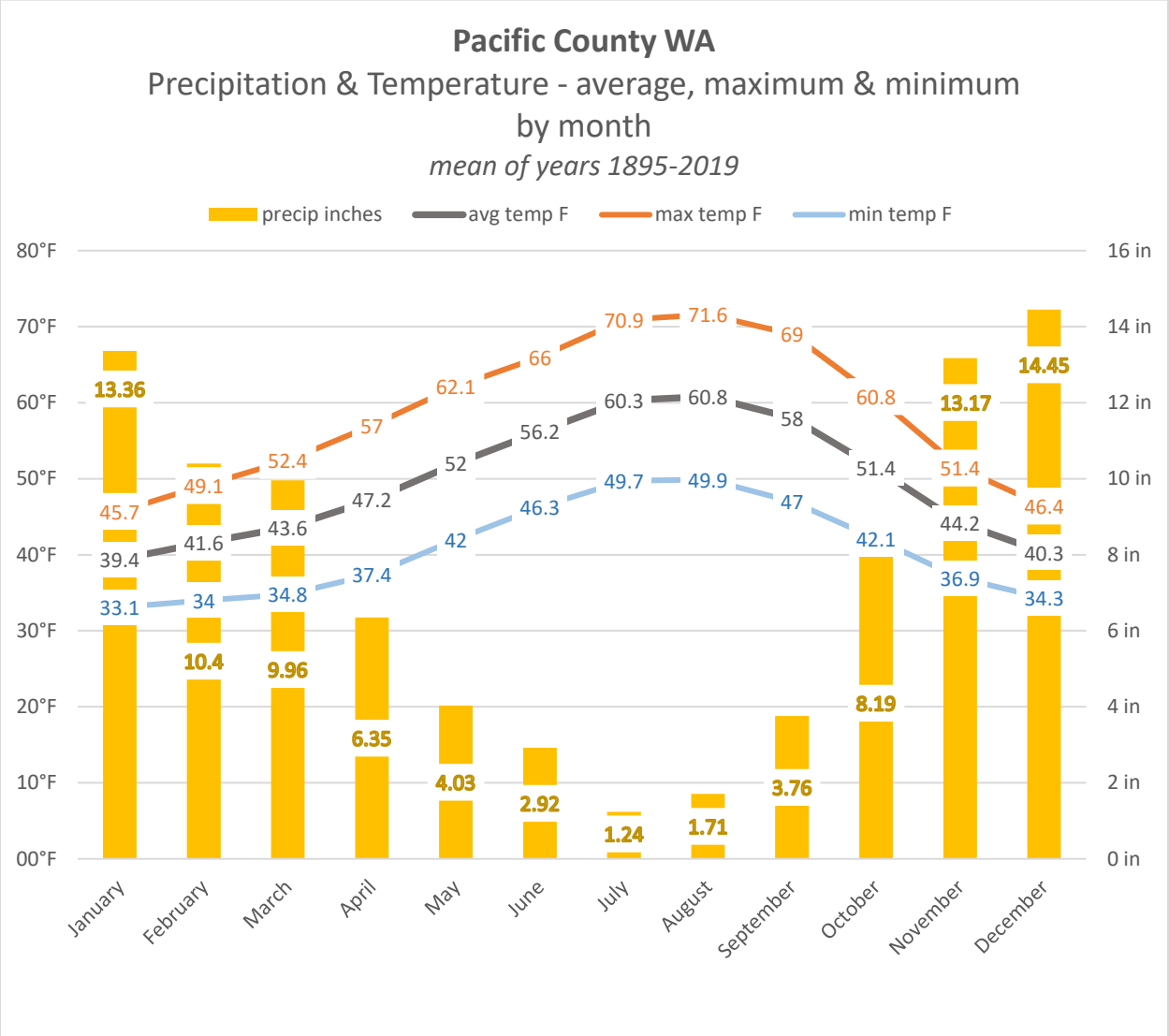
The area along the shore of northern Willapa Bay which contains the Shoalwater Reservation is classified generally as Ocosta Soils (NRCS, 2000). Three soil types dominate: Newskah Loam, Ocosta Silty Clay Loam, and Westport Fine Sand. The adjacent Dexter-By-the-Sea community is underlain with Yaquina loamy fine sand. Graveyard Spit has been described as Dunelands and Fluvaquents, with Ocosta Silty Clay Loam and Westport Fine Sands in the North Cove area.

CLIMATE

Average water temperature of the Pacific Ocean adjacent to Willapa Bay is 48° to58°F, and water temperature in the Bay is likely similar to and influenced by ocean exchange. Average temperature ranges from 34.9° to 72.4 °F, and there is an annual total average of 86.9 inches of precipitation[31]

[31] NRCS, 2000

Figure 45: Pacific County area climate



POPULATION AND ECONOMY

The Shoalwater Bay Indian Tribe is small, but increasing in population. The Tribe currently has 311 enrolled members and a resident service population of 1,148, with an annual tribal budget of approximately $2.5 million. About 110 members live on the Shoalwater Bay Indian Reservation. Many tribal members work at the Tribal Casino or in the Tribal Government. Tribal members are also commercial fishermen within Willapa Bay, and make use of local native plant species for Tribal crafts and ceremonial use.

The Shoalwater Tribe relied heavily, both historically and in recent times, on the diversity and productivity of the 700 acres of intertidal habitat and tide flats in the North Cove embayment. The barrier dune on Graveyard Spit afforded protection to the Cove from winter storm wave attack. The Shoalwater Tribe grew and harvested shellfish in North Cove, on which, along with ocean fisheries, they relied heavily for subsistence food supply. In addition, tribal members harvested local native plant species from the North Cove embayment for tribal crafts and ceremonial use.

PROPERTY, BUILDINGS AND INFRASTRUCTURE

Since the 2014 Plan update, the Shoalwater Bay has acquired significant acreage of nearby and adjacent parcels to its original Reservation lands. As of 2019, the Shoalwater Bay Reservation, Trust lands and fee lands totaled an area of approximately 3,388 acres. This is significant growth from the 2008 plan, when tribal lands totaled about 845 acres. Although no major structural developments occurred, the Tribe has expanded some facilities, such as the Shoalwater Bay Casino and the tribe's Georgetown Station, and acquired homes in the Dexter-by-the-Sea neighborhood.

For the plan update, the Tribe's GIS database of Tribal buildings was analyzed and updated. A list of the Tribe's insured facilities and equipment, housing, and commercial property (current for 2018-19) was also reviewed.

The updated GIS database indicated 108 structures owned by the tribe and/or on tribal lands. This is similar to the 75 structures identified in the 2014 plan update, as it was noted that additional garages, sheds and other outbuildings were mapped for the 2019 update. Tribal staff also noted that some buildings and sheds may have also been moved or torn down, affecting accurate comparisons.

Table 16: GIS Summary of Tribal Structures, updated, 2019

Tribal facilities and offices, including infrastructure	14
Commercial facilities & related structures	15
Residential structures (single, duplex, manufactured)	48
Storage sheds, garages and similar structures	31
Total	**108**

An analysis of the Tribe's insured structures and equipment can be summarized as follows:

Table 17: Insured value of Tribal Facilities & Equipment, 2019

Tribal housing	30 structures	$3.6 million, total insured value
Tribal facilities	28 structures, including equipment	$14.78 million, total insured value

Willapa Bay Enterprises (tribal commercial facilities)	20 facilities and equipment	$19 million, total insured value
Total	**78 structures & equipment**	**$37.38 million total insured value**

CRITICAL FACILITIES

- Tribal Center
- Shoalwater Bay Casino
- Wellness Center
- Tribal Police Station
- Shoalwater Bay Learning Center (library)
- Gymnasium (also used as Emergency Shelter)
- Eagle Hill Rd emergency shelter/all-purpose building

OTHER FACILITIES

- Natural Resources offices
- Smoke Shop
- Fireworks Stand
- The Tribe also operates an RV park adjacent to the Casino.

INFRASTRUCTURE

- The Shoalwater Bay Tribal water system consists of two wells and a 57,000 gallon storage reservoir.
- Main Tribal Municipal Sewer Treatment Plant. Located near Gym. Built by Indian Health Service. Designed for a capacity of 30 homes.
- Tribal roads: Eagle Hill Road, some residential roads/driveways, misc. logging roads
- Non-tribal roads: SR 105, Tokeland Rd, misc. residential streets
- power grid
- 1700 ft. protective berm, built by US Army Corps of Engineers in 2001. Run along coast parallel to Tokeland Rd from the RV Park to behind the Tribal Center.
- Two AHAB Warning Sirens
- Tsunami Evacuation tower

CULTURAL AND HISTORIC SITES

The ancestors to the Shoalwater Bay Tribe inhabited the shorelines of Willapa Bay for thousands of years. Early historical records note many of the former village and seasonal campsites around the bay and at the mouths of creeks. This plan does not specifically analyze such historic sites, but it remains a primary mitigation concern for the tribe, especially in regards to the effects of climate change and sea-level rise. In addition to village/campsites, the Georgetown Graveyard is of cultural significance for the Tribe.

Figure 46: Historic Tribal villages/camps - Willapa Bay, circa early 19th century